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ADDISON (adapted).



My dear
Zak

THOSE OTHER ANIMALS.

BY

G. A. HENTY.

WITH PORTRAIT OF THE AUTHOR



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TO THE READER.

MAN, being essentially a creature of habit, has come to look upon what he is pleased to consider as the inferior creation from one point of view only, and that in most cases the narrow and selfish one of his own interests; thus his views are frequently lamentably prejudiced and erroneous. The natural result has been that, while we condone the failings of those creatures we make useful to us, we ignore the virtues of other and much more estimable ones. Thus, we admire the Bee because we benefit by his labours, while we have not a good word to say for the Wasp, who is, in point alike of industry and intelligence, the Bee's superior.

An attempt has been here made to view some of the animal creation from a broader point of view, and to endeavour to do justice to those whose good points have been hitherto persistently ignored, and to take down others from the pedestal upon which they have been placed, as it would seem, unfairly and unreasonably. If some of the

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conclusions at which we have arrived are not in accordance with those propounded by men of science, we can only say that we are sorry for the men of science.

It has only to be added that some of these essays were first presented to the world in the columns of the *Evening Standard*.

G. A. H.

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THOSE OTHER ANIMALS.



THE ELEPHANT.

IT must be admitted that it is hard upon the citizens of the United States that the elephant is not found in the Western Continent. The Americans have an especial fondness for big things. They are proud that they possess the biggest Continent, the largest rivers, the longest railways, the loftiest trees, the most monster hotels, and the tallest stories of any people in the world. It is, then, extremely hard upon them that they have not also the biggest quadrupeds. Two good-sized quadrupeds, indeed, they had—the bison and the moose—but they are fast disappearing. As they were not the very biggest, the citizens of the States had no interest in preserving them. Had the elephant been there, he would, doubtless, have been religiously protected as a subject of national glorification. The elephant is not thought so much of in the countries where he resides. In India he has been utilised, but in Africa is prized only for his flesh and his tusks. He is considered to be a highly intelligent animal, and in books for children is generally

spoken of as the sagacious elephant ; but in proportion to his size he is rather a poor creature in the way of intelligence, and the brain of the ant, tiny as it is, contains more real thinking power than the skull of the elephant.

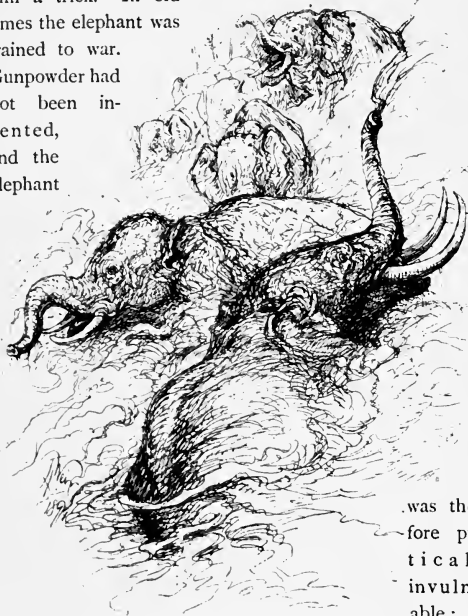
It can hardly be doubted that he owes much of the respect in which he is held by man to the peculiar formation of his proboscis. A large nose is generally considered as a sign of ability in man, but even the largest human nose is, since the change of fashion abolished its usefulness as a snuff-box, incapable of any other function than that of an organ of smell, and as a convenient support for a pair of spectacles. It is practically fixed and immovable, at least for all purposes save that of expressing the emotions of scorn and disdain. Man has, then, never recovered from the astonishment and admiration experienced by the first discoverer of the elephant at finding a beast capable of using his nose as a hand—of conveying his food to his mouth with it, and of utilising it in all the various work of life. This peculiarity has been more than sufficient to counter-balance the many obvious defects in the appearance of the elephant—his little pig-like eyes, his great flat ears, his short and stumpy tail, and the general hairless condition of his leathern skin. Then, too, mankind, even in the present day of advanced education, are worshippers of brute strength, as is evidenced by the attraction of the feats performed by strong men ; and the elephant possesses enormous strength. This, however, is positive rather than relative, for he is a poor creature indeed in comparison with the flea, or even with the beetle, both of which can move weights enormously exceeding their own. Even the donkey could, bulk for bulk, give the elephant points.

The elephant is but a chicken-hearted beast. In spite of his size and strength he is easily scared, and a hare starting up at his feet has been frequently known to have excited in him an uncontrollable panic. Now and then one can be trained to await quietly the charge of an angry tiger ; but this is rather because of the confidence that the animal feels in the shooting of the men he carries than in his own powers, and after having been once mauled he can seldom be induced to repeat the experiment. Naturally, the elephant is timid in the extreme ; the slightest noise startles him, and, except in the case of a solitary bull rendered morose by being driven from the herd by younger rivals, he will seldom unless wounded face man. He is, like most animals, capable of being taught something ; but when it is considered that he lives a hundred years, while the dog lives but ten or twelve, he would be stupid indeed if he did not in all that time come to some understanding as to what was required of him ; but even at his best, a well-trained dog is a vastly more intelligent animal. This, indeed, might only be expected, for the elephant's brain is smaller in proportion to its bulk than is that of almost any other creature, being little larger than that of man ; and while the brain in man is of about one-twenty-fifth of the size of the body, that of the elephant is but one-five-hundredth part. We should, therefore, pity rather than blame the creature for the smallness of his capacity. It may be said that Baron Cuvier, who made the habits of the elephant a subject of attentive study, came to the conclusion that at the best he was no more intelligent than a dog.

The elephant should have been admired by Dr. Johnson on the ground that he is a good hater. Although his brain

is not capable of holding many ideas, his memory of an injury is particularly retentive, and if he has to wait for years, he will get even at last with any one who has played him a trick. In old times the elephant was trained to war.

Gunpowder had not been invented, and the elephant



was therefore practically invulnerable; but

even then his utility was problematical, and if pricked by an arrow or javelin, he was as likely as not to turn tail, and to spread confusion and death in the ranks of the troops that marched behind him. His courage, in fact, is beyond

all comparison less than that of the horse, who seems to enjoy the clamour of battle, and will carry his rider unflinchingly through the heaviest fire. As a beast of burden the elephant has his uses, and in countries impassable to wheeled vehicles he is very valuable, especially in the carriage of pieces of artillery that could not be transported by any other available means. Upon a level road, however, he possesses no advantage whatever over smaller animals, which will not only drag larger weights in proportion to the food they consume, but will do so at much greater speed.

The elephant, in fact, appears to have been built up with a single eye to his own advantages, and altogether without reference to the use he might be to man. He is admirably fitted for sustaining the struggle for existence. The mechanism of his feet is such as to sustain to a nicety his enormous weight. His thick skin enables him to push his way through the thickest and thorniest jungles with impunity, and his flat ears closely set to his head also facilitate his passage. The great strength and pliability of his prehensile trunk, with its finger-like termination, enables him either to break off the massive limb of a tree or to pick up the smallest tuft of herbage. By its power of suction he can pour volumes of water down his throat, or cool himself by spurting it over his coat of mail. In his natural state, before man appeared upon the scene, he had few enemies, and it was therefore unnecessary to cultivate the attribute of courage. His bulk imposed upon smaller though fiercer creatures, and his thickness of skin protected him from their assaults. As for intelligence, he needed but a small degree of it,—his food lay everywhere within his reach, and he had no occasion for either craft or speed in obtaining it. He was a huge perambulating

machine for the conversion of vegetable matter into flesh, and as such he performed his functions admirably, and had no occasion to look further. In his progress, in fact, from the germ up to the elephant he steadily devoted himself to purely selfish ends. Courage was unnecessary, because he intended to be so large and so armour-clad that none would assault him, while, as he had no relish for flesh, he had no need for courage to assault or for speed to pursue others. It was useless to be intelligent, since for him there was no occasion either to hide or to seek. He had but to stretch out his trunk to procure abundant sustenance, and more brain than was needed for this would be but lumber. His digestive organs, on the other hand, were to be upon the largest scale, so as to permit him to enjoy the pleasure of constant and prodigious feeding. These points must have been steadily kept in view during the whole upward progress of the creature, and it is but due to it to say that they were crowned by perfect success. The elephant was a world to himself—not a very lovable, or intelligent, or courageous one, but sufficient in all respects for his own wants and desires; and it would be hard to blame him because he has not devoted himself to the cultivation of qualities that, although admirable in our eyes, would have been wholly useless to him in the career that he had marked out for himself.

THE CROCODILE.

THE crocodile and its very near relative, the alligator, possess a double interest to man. In the first place, they are the relics of a bygone age. Their cousins, the ichthyosaurus and the plesiosaurus, and the other great Saurians, have happily long since vanished from the world, but the crocodile is still with us, and doubtless retains traditions of the days when he and his relatives ranged undisputed masters of a swampy universe, undisturbed even by anticipations of changes and cataclysms that should render the world an unsuitable place of habitation for, at any rate, the larger species among them. The second reason for man's interest in the crocodile is the crocodile's marked partiality for man. The crocodile and the alligator differ very slightly from each other; the principal difference being that the alligator has a broader head, and that the hind feet of the crocodile are much more completely webbed than are those of the alligator.

The general observer, however, would see no greater differences between members of the various species of alligators and crocodiles than between different human beings; but the scientific man delights in subtleties, and there is nothing that affords him a deeper satisfaction than

in discovering slight peculiarities and differences that enable him to divide and subdivide, to invent fresh hard names, and so to deter as far as possible the general mob from the study of the subject. As, roughly speaking, the crocodile inhabits chiefly the Old World, while the alligator has almost a monopoly of the New, the former was naturally first known to man, and was an object at once of fear and admiration. Its mouth was so much larger than that of man, and its armour so much more perfect than anything that man could contrive, that it is easy to understand the admiration it excited. Our first written record of it is in Job; and it is there, under the name of Leviathan, spoken of as the bravest and most formidable of all creatures, as "a king over all the children of pride." The Egyptians, who were given to worship animals, and perhaps saw more of the crocodile than they liked, did their best to win its goodwill, and elevated it to the rank of a deity. Their tame crocodiles were well cared for; and although perhaps these did not derive any very lively satisfaction from being adorned with rings of gold and precious stones, they doubtless appreciated the abundant food with which they were supplied, and the feasts of cake, roast meat, and mulled wine occasionally bestowed upon them. The Indian variety have had an equally good time of it, and their reputation in that part of the world has lasted longer than in Egypt, and indeed still continues, large numbers being kept in tanks belonging to some of the temples, still regarded as sacred, and fed abundantly.

The alligator of Northern and Southern America, although it has always been held in great respect by the natives, has scarcely risen to the lofty position occupied

by its Eastern cousins. It has, nevertheless, held its own, being too formidable and well defended to be interfered with with impunity. Although killed and eaten occasionally, it was as a rule left severely alone, its flesh having a musty flavour, that needs a strong stomach and long familiarity to appreciate. Of late, however, evil times have fallen upon the alligator. A use has been found for it. So long as the dead crocodile was considered as worthless, save for the somewhat disagreeable food it furnished, so long the alligator was safe; but it was otherwise as soon as it was discovered that a portion of it was a marketable commodity. Some close investigator remarked that under its coat of mail it wore a leathern doublet exactly corresponding to it, and found that this doublet was capable of being turned into an excellent peculiarly-marked leather. From that day the fate of the alligator was sealed. It will doubtless be a long time before it is exterminated, even in the United States; but, like the bison, it has to go. Already on the rivers where the population is comparatively thick it has become rare, and even in the swamps where it formerly was undisputed master the search is hot for it. Theoretically this will be a matter for regret; practically its loss will not be sensibly felt.

It may be owned that the alligator has been to some extent maligned, and that the number of human beings destroyed by it was by no means so great as its exceeding numbers in some of the sluggish rivers of the Southern States or of South America would warrant one in expecting. Nevertheless, it was certainly a very formidable foe, and a swimmer attacked by it had but small chance of escape. Unlike the shark, the crocodile kills its

prey by drowning ; the shark can take off a limb with a single bite, the alligator has no such power. Its teeth are sharp and pointed, but placed at irregular distances apart, and though these can wound and lacerate sorely they have no cutting power whatever, and when it has captured and drowned a prey too large to be swallowed at a mouthful, hides it up in a deep hole or under the river bank until it decomposes sufficiently for the reptile to be able to tear it in pieces. It is said that any one seized by an alligator or crocodile can, if he possess a sufficient amount of presence of mind, compel the creature to let go by thrusting his thumbs into its one vulnerable point—its eyes. The experiment, however, is one that cannot be recommended. It would doubtless be interesting, but, like Alpine climbing, the satisfaction of success would scarcely compensate for the risk incurred.

In no creature have the defensive powers been carried to the same perfection as in the case of the crocodile : its coat of armour is absolutely invulnerable to the weapons that it was intended to withstand ; and even now that man has armed himself with rifles, he is unable to penetrate its defence unless the creature is struck in the eye or in the thick skin of its leg-joints, which are comparatively exposed. The coat of mail, doubtless, possesses certain disadvantages, as did the armour worn by the knights of the Middle Ages ; while this was proof against missiles of all kinds, against sword and dagger, the knight, if unhorsed and hurled to the ground, was unable to rise without assistance, and lay a helpless victim to the dagger of the meanest camp-follower. So it is with the crocodile ; it can turn its head but at a slight angle with its body, and can turn itself only by means of

a long *détour* ; hence an active man or an animal of any kind can easily escape it, unless suddenly seized or knocked over by the sweep of its tail.

The crocodile possesses many amiable qualities. It is an excellent mother.' It does not indeed sit upon its eggs like a hen, but this is simply because it knows that the heat of the sand in which it buries them is amply sufficient to hatch them. The earlier crocodiles, which doubtless followed the example of birds, would speedily discover that what was good for the goose was not good for the crocodile, and that while but a small supply of heat passed through their armour, its weight was disastrous to the well-being of the eggs. The crocodile, however, carefully guards the buried eggs, and as soon as they are hatched watches over the young with anxious and continued care ; she escorts them to the water, and once there protects them to the utmost of her power from all assailants, among whom, it must be admitted with regret, the male crocodile figures prominently. This care on the part of the mother continues during many months of the young crocodile's life. In spite of this, only a small proportion of them arrive at maturity, for in their early days great numbers fall victims to vultures and other birds during their rambles on shore. Like all saurians, the crocodile is partial to warmth, and as it is capable of prolonged fastings it is able to spend a considerable portion of its life basking or asleep on the sands in the sun.

The crocodile's eye is provided with three distinct lids. It is evident that this advantage admits of an extraordinary variety of what may be called eye-action, and it is probable that these animals are able to converse with each other

by means of the varied action of the lids. Man is able to convey a great deal of expression by the action of a single eyelid, and it is reasonable to suppose that the alligator would not have been provided with a triple eyelid had it not been able to utilise these coverings in a very marked manner. It is strange and somewhat unfortunate that this peculiarity should not have been made the subject of much further investigation and research by scientific men than has hitherto been bestowed upon it. It is evident indeed that we have still much to learn concerning the crocodile; and in view of its early disappearance, it is to be hoped that the matter will speedily be taken in hand by some trained investigator.

THE CAMEL.

DURING the countless ages that must have elapsed in its upward progress from the original germ, by the various processes of the survival of the fittest, selection, and adaptability to circumstances, it is clear that the camel kept its eyes strictly to business. The object of the germ and its descendants was to build up an animal that should be capable of enjoying existence in the desert. To this they turned all their attention, with, it may be admitted, marvellous success; but it must be added that, while so doing, they unaccountably neglected the beautiful, and turned out a creature which in point of awkwardness and uncouthness stands completely apart from the rest of the brute creation. The camel's wide, spongy feet save it from sinking in the sand, its long neck enables it either to allay irritation by gnawing itself down its spine to the root of its tail, or to grab a rider by the foot, while its hind legs are specially adapted by their length to allow it to scratch itself behind the ear. It may be admitted that in these respects few animals have its advantages. As a provision against sand storms it has the unique faculty of being able entirely to close its nostrils; while by complicated internal arrangements it is able to carry its water supply about with it

for some days. Probably the camel did not foresee that, while thus little by little perfecting itself for a life in the desert, it was constructing an animal that would be exceedingly useful to man, and was preparing for itself and its descendants a lifelong servitude; but so it has been. The camel was one of the very first animals that man turned to his use. Jacob possessed camels, and Joseph was carried away into Egypt by a caravan of Ishmaelites with laden camels. Job possessed three thousand camels at the beginning of his misfortunes, and was promised six thousand at the end. The camel has, in fact, from the first been made a servant by man; it is only in Central Asia that it is known to exist in a wild state, and it is far more probable that these wild camels are the descendants of some escaped from captivity, than that they should all along have retained their freedom.

The camel is capable of great and prolonged endurance if not overloaded or overdriven; but it is a mistake to suppose that there are no limits to its powers in this way. The authorities of the Nile Expedition fell into this error, with the result that in three weeks after its start from Korti, the four thousand camels collected and brought up at so great an expense were all practically *hors-de-combat*, more than half being dead and the rest reduced to the last stage of misery and weakness. The camel on this occasion showed its usual obstinacy, and insisted on dying as a protest against being obliged to travel night and day with utterly insufficient quantities of food and water. A similar result followed the confidence of the authorities of the Abyssinian Expedition in the power of the camel to exist without water when dumped down by thousands on the bare sands of

Annesley Bay. The failure of the camel upon these occasions must not, however, be imputed to it as blame. In its progress from the germ it had anticipated only the conditions under which it would naturally find itself, and had made no allowance for the stupidity of man.

It is not surprising that the camel, finding itself from the first reduced to slavery and converted into a beast of burden, should have developed a bad temper. No epithet was ever more ridiculously misapplied than that of patience in connection with the camel. It is, in fact, only possible to account for its use upon the ground that when first applied the word bore its strict Latin signification, and that it was the "suffering" and not the "long-suffering" signification of the word that renders it applicable. The life of the camel is spent in one long protest against its lot. It grumbles and growls alike when it is laden and unladen, when it is ordered to rise or to kneel; to stop or to go on; it roars threateningly at any animal that approaches it, and is ready at all times to take a piece out of any one who may place himself incautiously within reach of its teeth, and even when lying down will shoot out its hind leg with wonderful activity and viciousness to a distance of some two or three yards at a passer-by. The camel has literally no pleasures; its life is one unbroken round of toil, and it would seem almost that it has cultivated ill-temper until it has become a form of enjoyment. Even the camel's walk is evidently the result of deep calculation, for it is of all kinds of gait the most unpleasant for its rider. The camel has its regular pace,—it will walk two miles and three-quarters an hour, neither faster nor slower,—and however urgent the need of haste may be to its owner, neither blows nor execrations will induce the

camel to quicken its pace except for a few hundred yards, at the end of which it will settle down into its regulation stride, with doubtless much inward chuckling at its rider's exasperation. It would not be fair to blame the camel for this ; its disposition has been embittered, and it is not unreasonable that it should find an alleviation in the only



way open to it. Indeed, man has much reason to be grateful that the obstinacy of the camel does not take the form of refusing from the first to live, rejecting sustenance, and persisting in giving the whole thing up as soon as its eyes are open to the lot awaiting it.

There are breeds of camels that differ materially from the ordinary specimen in point of speed. The Heirie or Maherry,

and the Sabaye, are very swift, and will keep up a trot of eight or nine miles an hour for many hours together, and have been known to perform a journey of thirty-five days' caravan travelling in five days, doing six hundred and thirty miles ; while Purchas says that camels will carry messages from Timbuktú to places nine hundred miles distant in less than eight days. These fast camels have but one hump ; but this is also the case with some of the beasts of burden. The object of these humps is not very clear, but it is supposed that as the stomachs are a reservoir of water, so the humps are natural portmanteaus in which the animals convey a reserve of sustenance to draw upon in case of need. It is, at any rate, certain that the fatty substance composing the humps considerably diminishes and dwindles when the animal is overworked.

The camel has courage as well as endurance : it goes on at its regular pace like a clock that is wound up, until it stops suddenly and falls ; when it once does so, nothing can induce it to endeavour to use its feet again as long as man is present, although after the departure of the caravan it has been known to get up to browse on the bushes, and to find its way back to the wells from which it started in the morning. It is very insensible to pain. Count Gleichen, in his account of the Camel Corps in the Nile Expedition, gives many instances of this ; notably the case of one camel which, having had its lower jaw shot off by a ball from an Arab matchlock, yet continued its journey to the end of the day in apparent unconsciousness that anything unusual had taken place. The one form of enjoyment of the camel is that dear also to the donkey and horse—namely, a roll in the sand. This appears to afford it great

comfort and consolation, and after an indulgence in it, it is ready; when again loaded, to start with renewed vigour. The Heirie, being better treated and cared for than the ordinary camel, is naturally a very much better tempered beast than his humble congener, and is even capable of exhibiting an affection for his master. This is in itself a proof that the moroseness of disposition so general in the race is due to the treatment they receive from man, and not from any inherent incapacity to see things on their bright side; and the thoughtful should pity rather than blame camels for using their only available means of exhibiting their disgust and discontentment with their hard and joyless lot.

THE DONKEY.

WHILE the dog has risen vastly in the scale since Scriptural times as the friend and companion of man, the donkey has as distinctly descended. There is no reason for believing that this is the fault of the donkey, but lies rather in the want of appreciation on the part of man. The donkey is, indeed, to no small extent the victim of appearances, and it can hardly be doubted that the length of his ears has told terribly against him. This is not because there is anything inherently objectionable in a donkey's ears. They match admirably with his general appearance, and their constant movement evinces the animal's intelligent interest in what is going on around it. Unfortunately for the donkey, however, men are accustomed to see in all other creatures ears bearing a smaller proportion to the general bulk than they do in the case of a donkey, and, therefore, rashly and foolishly, jump at the conclusion that the donkey's ears are excessive. This being once established, it naturally follows that man should attribute various bad qualities to the donkey, simply because his ears are large ; but he is specially credited with stupidity and obstinacy. We do not hesitate to say that the stupidity is very much greater on the part of man, who

fails to recognise the characteristics of one of the most worthy of animals, than on that of the donkey himself ; for it may be doubted whether any individual of the animal creation possesses so many virtues as he does. He is strong, hardy, patient, laborious, and, in his wild state, fleet and brave. He can live on the most meagre provender ; he can stand all climates. He is a willing servant, and does not despise humble work. He is affectionate whenever he gets a chance of being so, and is one of the most intelligent of animals. The horse is more showy, but in proportion to the amount of food he consumes, and to his weight and size, he is less strong than the donkey ; he is undoubtedly less intelligent, and, in spite of his size, he is no fleeter. The wild ass can leave the horse behind him ; can climb precipices inaccessible to his rival, can go fearlessly along mountain paths where the horse would not dare to tread, and is in no way inferior in courage. Well groomed and cared for, his coat is almost as sleek and glossy ; while he is free from the various vices that so often mar the usefulness of the horse.

When living under similar conditions, the horse recognises at once the superior sagacity of the ass. On the great ranches of the Western States of America donkeys are frequently turned out with droves of horses, and in such cases the donkey is always accepted as the leader, and the horses gather round him, or follow his footsteps with implicit confidence. The wild stallion on the plains is a very formidable animal, and is more than a match for man himself when unprovided with firearms ; but the ass has no fear of it, and the testimony of the plains' men is unanimous that in a combat between them the jack is likely to come out the victor. In such cases the donkey

is well aware that he is no match for the stallion with his heels, but fights with his teeth, and the combat resembles that between a well-trained dog and a bull. The jackass will rush at his opponent, and, skilfully dodging the blows from its fore legs, will leap at its throat, and, having once caught hold, his grip cannot be shaken off. In vain will the stallion strike at him, in vain lift him in the air and hurl him down again, for the jack, with his legs well apart, will always come down on his feet. In vain will the horse throw itself down and roll with its opponent. The jack will hold on until the horse succumbs to his grip, or the flesh he has seized comes away in his hold.

Seeing his utility to man, his willingness to give all his strength for so slight a return, his patience under hardship, starvation, and cold, it is wonderful that the ass is not more highly appreciated, and that he does not occupy a far higher place than he does in our regard. In one respect only has the ass a weak side. If, as the philosopher says, silence is golden in the case of man, it is still more so in the case of the ass. The donkey prides himself, not upon his many and sterling virtues, but upon what others consider to be his greatest failing. Unfortunately, like many human beings, he entertains an altogether mistaken idea as to his vocal powers, which he never loses an opportunity of exhibiting. Other animals use the voice for the purpose of expressing their emotions. The dog's bark expresses joy, watchfulness, or menace ; his growl, anger ; his whine, impatience or discontent. The horse is naturally silent, but his neigh is indicative sometimes of welcome, sometimes of impatience. Love is the burden of the bird's song. Maternal solicitude, or a desire for food, that of the baa of

the sheep. The donkey's song appears to express nothing but his desire to favour all within hearing with a specimen of the beauty and power of his voice, and of his amazing vocalisation. Thus he lifts it up at all times, and in all places, whenever the idea seizes him, and the utmost in-



telligence of man has hitherto failed to grasp the meaning of the strange, varied, and prolonged cachinnations. The boldest animal trembles when it hears them. Man puts his hands to his ears, and flies. It is not a challenge, it is not a call; it is indicative neither of hunger, nor of anger, nor of satisfaction. It seems simply a vocal effort, and as such is unique, but, unfortunately for the donkey, it is

unappreciated. The connection between a donkey's voice and his tail is obscure, but undoubted. It is impossible for him to do justice to himself unless his tail be elevated, and advantage has been taken of this peculiarity by man, who is apt at turning the weaknesses of others to his own benefit. It has been found that by attaching a weight to a donkey's tail—a brick is sufficient—neither the tail nor the voice can be elevated. In this respect it must be owned that the donkey is easier to deal with than a woman; for while the former can be effectually reduced to silence, no means have hitherto been discovered for suppressing ladies with a mistaken estimate of their vocal abilities.

Happily of late there has been some slight reaction in favour of the donkey, and the Society for the Prevention of Cruelty to Animals has done something towards impressing upon the minds of the class of men who chiefly utilise the services of the ass that the animal is not altogether insensible to pain, that he needs a certain amount of sustenance, and that there is a limit to his draught powers. Why a mistaken idea upon these points should have so long prevailed is by no means clear. That it *has* prevailed is evident from the fact that a certain class of men brutally misuse donkeys, as they misuse no other creatures save their wives. Men do not take an absolute pleasure in beating dogs; but no one can doubt that the brute who lays a heavy stick across an unoffending donkey does feel a malicious joy in the pain he gives. Matters are better than they were; the schoolmaster is abroad, and so are the policeman and the officer of the Society, and between them some slight alleviation of the lot of the ass is in progress. But even now the spectacle of five or six hulking

louts seated behind a staggering little donkey, and urging him on his way with oaths and blows, may be witnessed any Sunday or Bank Holiday afternoon, upon every road leading through the suburbs into the country, to the disgrace alike of our civilisation and humanity. In Egypt and in the East the donkey still holds something of his former position in public esteem, and even a portly merchant, or a grave functionary, has no idea that he is in any way demeaning himself when, perched upon the top of an enormous saddle, placed on the back of a donkey, he proceeds about his business. Had the capacities of the ass been equally recognised in the West, the cycle would never have obtained such a height of popularity as it has done. A well-made cycle will cost almost as many pounds as a donkey will cost shillings. Its expenses of repair will equal in cost the keep of the donkey, and, except as a means of promoting perspiration and keeping down flesh, no human being would compare the easy and gentle amble of the donkey with the labour required for a cycle as an instrument of progression. It is a pity that among the many good works that have been effected by the influence of Royalty that of raising the donkey in public esteem has hitherto had no place. The appearance of the Princess of Wales in the Park, in a light equipage drawn by two handsome donkeys, would in a short time produce a moral revolution, and the good little beasts would soon resume their proper place in popular favour.

THE DRAGON.

LIKE the dodo, the moa, and the great auk, the dragon is admittedly an extinct animal, but that is no reason why his characteristics should not be considered in these pages. The question that has long agitated scientific men is, first, as to the extent to which the personal peculiarities of the dragon have been exaggerated by popular tradition, and in the second place as to the period at which he became extinct. There have been those who have even asserted that his existence was purely apocryphal, but with men so mentally constituted argument is useless. The traditions of almost all nations point to the fact that not only did the dragon exist as a race, but that individual dragons continued to exist down to comparatively modern times. We may set aside at once the dragon of Wantley. Cæsar makes no allusion to dragons existing in Great Britain; Wantley did not exist before Cæsar's time; therefore there can have been no dragon at Wantley. But it is not possible so summarily to dispose of all legends, and it is remarkable that the dragon should figure with almost precisely the same characteristics in the folk lore of both Western and Oriental peoples. Our most valuable national coin bears its portrait, and it is the national emblem both

of China and Japan. St. George, as we know, was a warlike saint of Cappadocia; although his feats and adventures are somewhat doubtful and misty as to locality, it may be assumed that the dragon who succumbed to his prowess was a native of Asia.

The dragon is, in fact, an exceedingly interesting problem, and the balance of probability appears to be wholly in favour of his existence. We know that great winged saurians inhabited the earth in prehistoric times, and such a creature would be likely to survive cataclysms which overwhelmed the greater portion of his contemporaries. Water would not seriously inconvenience him. His habits would on the whole be retiring, and until man multiplied and became thick over the world, there would be but small inclination to interfere with him. The saurians attain to extreme longevity, and if only a few specimens escaped at the time of the flood, their descendants of a very few generations would have existed in comparatively modern times. The Chinese legends point to the preservation of the dragon in this manner. They say that at a time which closely approximates to that generally assigned to Noah's deluge, great floods extended almost to the boundaries of China, and that it was at that time that the dragons first made their appearance and became a serious scourge in some of the frontier provinces. Doubtless the European traditions connected with the dragons were brought by the tribes which wave after wave poured in from Central Asia, and it must be assumed that there, if anywhere, the survivors from the flood for some time flourished.

It is certainly difficult to assume that the descriptions of these creatures by so many peoples and such diverse sources

would be all but identical, had they been purely the work of imagination and not drawn from a living model. All accounts unite in describing the dragon as a creature clothed with scales, possessing a flexible neck like that of the plesiosaurus, a large head, with jaws well furnished with pointed teeth like the crocodile's, a flexible tail like the lizard's, and wings like a pterodactyl's. The flying apparatus of these extinct creatures, indeed, closely resembled that of a bat, being a membrane from the vastly extended finger of the fore leg to that of the hind leg. This does not agree with the popular idea of the dragon, but the ancients were not close observers, and it was quite enough for them to know that their gigantic enemy was furnished with wings, without inquiring closely into their arrangement. It does not appear that the dragon was able to fly, but it would rather seem that when he ran to attack an enemy he aided himself by flapping his wings, as a swan often travels along the surface of the water before it fairly takes to flight. Some of the dragons are depicted as altogether devoid of wings, the Imperial Japanese dragon showing no signs of such appendages. Thus both the Chinese and Japanese legends go far to prove that several species of saurians survived for some time the general disappearance of their prehistoric congeners. The legendary dragons differ but slightly from some of the prehistoric reptiles, and as the Orientals were entirely in ignorance of the former existence or appearance of these creatures, it is difficult in the extreme to believe that they could have coined from their own imagination a creature so closely resembling them.

In one respect only we must admit an error, and a serious one. Most of the legendary dragons possessed

stings at the tip of their tail. We give up the stings, but at the same time would urge that this error cannot be considered as destructive of the truth of the legend. In the present day it is popularly believed by the vulgar that the larva known as the Devil's Coach Horse—a creature which when alarmed carries its tail in a threatening manner over its head—is, like the scorpion, armed with a sting. In some countries, too, it is believed that dragon-flies are similarly armed. If, then, such errors can exist in an age of general enlightenment, it may well be that in older times the dragon, a creature certainly rare as well as very terrible, was by the popular fancy endowed with means of defence even more formidable than those he possessed. The breath of the creature is in all legends relating to it described as fœtid and poisonous. And as undoubtedly snakes exhale a fœtid odour, there is nothing improbable in the assertion that the dragons also did so.

No details whatever have come down to us as to the domestic habits of the dragon. We only know that he desolated whole provinces, and that the only method of preserving the community from his attacks was the appeasement of his appetite by the offering of victims. These victims are generally represented as being young females, but it is not probable that the dragon himself was particular on this score. Women would be chosen for the tribute, partly because it was supposed that their tender flesh would be more gratefully received than that of tougher victims; but much more because women were in those days considered of smaller account than men, and could be pounced upon and handed over to the monster with much less fuss and trouble than would have been the case had

fighting men been chosen. Women's rights in those days were much less perfectly understood than at present ; and the question of the equality of the sexes had not so much as occurred even to the most speculative philosophers. The origin of the story of the female tribute evidently is, that the dragon was too formidable a creature to be assailed, and that it was deemed sound policy to keep him in a state of lethargy in the cave in which he dwelt by supplying him with an occasional victim, rather than that he should sally out and make his own selection. The whole story would seem to show that the dragon was, like most saurians, content to pass a tranquil existence unless when disturbed ; that, like the rest of the race, he was capable of prolonged fasts ; and that, huge as was his bulk, a meal once a month or so sufficed for his needs. The dragon was said to roar, and this again is another confirmation of the truth of the legend, for the crocodile when enraged can bellow like a bull, and this would naturally be the sound that a great saurian would utter. Upon the whole, it is evident that the balance of probability inclines heavily towards the reality of the existence of the dragon up to comparatively modern times ; and we may still cling to the belief that the national legend of the victory of St. George over the dragon is not wholly apocryphal, but possesses a large substratum of truth.

THE TORTOISE AND TURTLE.

THE tortoise has in all ages been an object of wonder to man. Its form, its slowness of movement, its wonderful coat of armour, its power of prolonged fasting, the absence of any apparent pleasure in its existence, have all seemed to set it apart among living creatures. The Orientals, who are profound thinkers, arrived at the conclusion that the world must be held up on the back of a tortoise, no other creature appearing capable of sustaining the burden. But even their powers of speculation shrank from endeavouring to cope with the inevitable problem: what in that case held up the tortoise? There was nothing in the habits or customs of the tortoise, as met with on the surface of the earth, that could authorise the supposition that it could, in any state, not only support itself in the air, but hold up the not inconsiderable burden of the earth; indeed, the problem was evidently so insoluble an one that we meet with no trace in any of the writings of the early pundits that they ever attempted fairly to grapple with it.

It would certainly seem that nature has been more unkind to the tortoise than to any other creature. It has given it nothing whatever to compensate for the dulness of its existence or its slow and laborious method of progression.

Almost all other creatures are, in their youth at any rate, gay and frolicsome, delighting in their powers of speed and activity. No one has ever observed the tortoise at play; it can neither run nor frisk, climb a tree, nor throw a somersault. It plods gravely on from its birth to its death, like a creature in a living tomb, carrying a burden that seems almost too great for its strength—eating a little, sleeping a great deal,—thinking, it must be presumed, for even a tortoise must do something, deeply and uninterruptedly. As it sees so little of the world around it, we must suppose that its meditations are self-directed, and that it is continually occupied with attempts to solve the problem of the why and the wherefore of its own existence. As it has a hundred years to think this out, there is no reason to doubt that were the tortoise capable of conveying its thoughts and conclusions to man the results would be of the highest value, and that it would be found that the speculations of our deepest thinkers are shallow indeed by the side of profound meditations of the tortoise. It has, too, the advantage of long traditions, and the accumulation of the wisdom of ages; for the tortoise is, perhaps, the oldest existing creature on earth. Its congeners, who ranged with it the surface of the earth countless ages before the present race of animals existed, have all passed away, but the tortoise remains almost identical with his far-off ancestors.

The number of varieties of the land and water tortoise, the latter known as the turtle, are very great, and are of high interest to scientific men; the points of structural difference between them, especially in the skull, being very much more numerous and important than those existing between any species of animals, birds, reptiles, or fish.

Their habits differ as widely as their structure. Of the land tortoises, some prefer a vegetable diet, some insects, worms, and molluscs, while some of the larger turtles will feed upon fishes and small aquatic birds. Both land and water tortoises are capable of fasting for upwards of a year. Their tenacity of life is extraordinary, for their hearts will continue to beat, and they are still able to move their limbs with considerable force, for ten or twelve days after their heads have been cut off. The tortoise is sensitive as to weather; it does not like too great heat, and lies in the shade when the sun is strong. It equally objects to cold, and buries itself under loose rubbish, or scrapes itself a hole in the ground on the approach of winter, taking many weeks about the operation.

It might be thought that, clad in its waterproof coat, it would regard rain with indifference; but this is far from being the case, for if a shower is at hand it will hurry away to shelter. It can only be supposed that this extreme sensitiveness to all atmospheric changes has been bestowed upon the tortoise to afford it matter for interest and excitement. Not only does it sleep throughout the whole of the winter months, but in summer it retires to rest early in the afternoon, and remains asleep till late in the morning. In the Galapagos Islands the tortoises rival in size those of the pre-historic period, weighing three or four hundred pounds. The speed of these animals is relatively fast, for they can travel as much as six yards a minute. The water turtle attains even a greater size, individuals having been taken weighing from sixteen to seventeen hundred pounds.

The life of the turtles and fresh water tortoises is a lively one in comparison to that of the land species.

Instead of the short and misshapen legs that serve the purposes of locomotion to the latter, they are furnished with paddles that enable them to swim with great rapidity, and were it not for their sleeping habits, and for the necessity for the females to go ashore to lay their eggs, man would have but few opportunities of enjoying turtle soup, for their speed is far greater than that at which any boat could be rowed. They are thus able to obtain an abundance of food from the slower moving fish; and as their power of jaw is very great they are practically masters of the waters they frequent. Those close observers, the Chinese, who have a marked partiality for turtle, do not rely wholly upon its sleepiness of habit or its occasional landings for their supply of soup; they employ in their service a fish of the *Remora* species, which is of peculiar construction, and possesses a great power of grip. These fish are trained to the work, and taken out in tubs in the fishing boats. To the tail of each fish a ring is attached, and to this the fisherman attaches a long cord, and slips the fish overboard as soon as they approach a basking turtle. Directly the fish discovers the turtle, it makes towards it, and fixes itself firmly to it by means of a peculiar apparatus upon its head. The fisherman then hauls in the rope, and pulls both fish and turtle to the boat, and on getting them on board pushes the fish's head forward, when it at once looses its hold. The story would appear incredible were it not vouched for on high authority.

Except as an example to man of patience under a singularly joyless life, the purpose of the land tortoise is not very marked. The second lesson it teaches—namely, that a life of indolence and lethargy conduces to extreme

longevity—can scarcely be considered as an advantageous one. One species, indeed, furnishes a material that is utilised principally for the manufacture of combs and female ornaments, and it was remarked by the Brothers Mayhew as singular that the tortoise which supplies ladies with combs has itself no back hair. However, even in this respect the uses of the tortoise have of late years been greatly discounted by the introduction of compounds of india-rubber for the purpose of combs, and the decline of the fashion for the lofty decorative combs used by our



grandmothers—a fashion which, however, appears to be, to a certain extent, reviving just at present.

Properly considered, the tortoise should be viewed as an example to be avoided rather than followed. Had it not been for the indolent habits of the pre-historic tortoise, there can be little doubt that it would in time have effected very considerable changes in its structure. The survival of the fittest might not have done much for it, as all tortoises can hold their own in the way of living on. But the progress of selection, the intermarriage between active males and females, would naturally have led in time to a much greater development of leg, and the tortoise might have become as speedy on land as the turtle in water.

Unfortunately active tortoises, male or female, were extremely scarce, and the result of ages of indolence has been that the race has remained absolutely without progress, and that no visible improvement has been effected since its first introduction among the inhabitants of earth. The lesson furnished by it cannot be too earnestly taken to heart, especially as we see the same thing, although in a modified extent, among the lower races of humanity.

THE SHARK.

PHILOSOPHERS, although as a rule men of exceedingly positive opinions, wholly averse to confess their ignorance upon any point whatever, have failed signally in arriving at any satisfactory conclusion as to the advantage of the shark in the general scheme of nature. It has been suggested that it was created specially for the repression of conceit in man, and to show him that he was not, as he might otherwise have supposed, the undoubted lord of the inhabitants of the water as of the dwellers upon earth. Given special advantages—such as that of holding the end of a stout rope, at the other extremity of which is a hook fixed in a shark's mouth—man may, with the assistance of a number of his fellows, have the best of the shark. But alone, and in the water, the advantage is wholly and absolutely the other way, and the strongest swimmer and the bravest heart fail when the tyrant of the sea seeks to make his acquaintance. It is true that reports have been current that there are natives of the islands of Southern Seas, who, armed with a knife, fear not to go out and give battle to the shark in its own element, but these tales must be accepted with caution, and are akin to the many apparently authentic narratives of the appearance of the sea-serpent.

The shark is a creature gifted with great strength, a savage

temper, dogged perseverance, and exceptional power of jaw. The lion and tiger may mangle, the crocodile may lacerate, the bulldog may hold fast—the shark alone of living creatures possesses the power of cleanly nipping off a human limb at a bite. One ill service nature has done the shark, namely, that of placing a triangular fin on his back, which acts as a danger signal and gives warning of his approach. Happily the shark has not been gifted with sufficient sagacity to be aware of this peculiarity, for had he been so he would unquestionably have abandoned his habit of swimming close to the surface of the water, and would in that case have been enabled to approach his victim unobserved. The shark is a slow swimmer for his size and strength. Byron observes, "As darts the dolphin from the shark," but Byron was a poet, and does not appear to have been a close observer of the habits of the inhabitants of the water; or he would have known that a shark would have no more chance of catching a dolphin than a sheep would of overhauling a hare. A shark will keep up with a sailing ship, but it is as much as it can do to follow in the wake of a fast steamer, and a torpedo boat would be able to give it points.

As it is a source of wonder how the flea manages to exist in the sand, where his chances of obtaining a meal may not occur once in a lifetime, so naturalists are greatly puzzled how the shark maintains himself. The ocean is wide, and the number of men who fall overboard small indeed in comparison to its area. The vast proportion of sharks, then, must go through their lives without a remote chance of obtaining a meal at the expense of the human kind. There is no ground for the supposition that the shark can exist upon air. He is not, like the whale, provided with an

apparatus that enables him to sweep up the tiny inhabitants of the seas. He is too slow in swimming, and infinitely too slow in turning, to catch any fish that did not deliberately swim into his mouth ; and unless we suppose that, as is said of the snake, he exercises a magnetic influence over fish, and causes them to rush headlong to destruction between his jaws, it is impossible to imagine how he obtains a sufficient supply of food for his sustenance. As it would appear that it is only when he gets the good luck to light upon a dead or badly injured fish that the shark has ever the opportunity of making a really square meal, his prolonged fasts certainly furnish an ample explanation and excuse for his alleged savagery of disposition.

The scientific name of sharks is *squalidæ*, though why scientific men should have fixed upon such a title is not clear, for there is to the ordinary eye nothing particularly ragged or squalid about the shark's appearance. The shark belongs to the same section as the ray, which fish, however, resembles its cousin the shark only in the awkward position of its mouth, and in its astonishing power of biting, it being able to indent an iron boat-hook or bar. The immemorial enmity between man and the snake on land is not less bitter and deep-seated than that which man on the sea cherishes against the shark. In this case, however, it is one-sided, everything pointing to the fact that so far from having any hostile feeling for man, the shark has an excessive liking for him. It is as unjust to charge the shark with hostility towards man as it would be to accuse man of a savage animosity against the ox or the sheep. To the shark, man is food to be eaten, that is all ; and man, the almost universal devourer, is the last who is entitled to blame

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the shark on this ground. The Maori has always been regarded as a remarkably fine specimen of a savage, and his liking for "missionary" has never been seriously imputed to him as a grave failing. Man's likes and dislikes are unfortunately sadly tinged with selfishness. Many men go to sea, and therefore the man-eating propensities of the shark excite in us a feeling of indignation. The proportion of men who went out as missionaries to the Maori was so small as to be altogether inappreciable, and the majority therefore regarded the weakness of the Maori for them from a purely philosophical point of view.

Fortunately for the inhabitants of these islands, the aversion of the shark to cold water is as much marked as is that of the occupants of the casual wards of our workhouses; and the consequence is that the larger and more dangerous species are very seldom met with on our coasts, and upon the rare occasions when they visit us, are in so low and depressed a state of mind from the cold that their appetites appear to be wholly in abeyance, and there is no record of a bather having been devoured at any of our seaside watering places.

The eye of the shark is small, long, and narrow, closely resembling that of a pig. All observers have agreed in attributing to it a sly and malicious expression, but this must to some extent be taken as a flight of fancy. The only real reason for attributing to the shark a savage disposition is that, like the wolf, it has no pity whatever for a comrade in distress, and a wounded shark will be instantly attacked and devoured by its companions. This is, indeed, an evil trait in the creature, and can be excused only on the ground of its prolonged fasts, and the overmastering demands of its appetite.

The shark, like the elephant, is of a timid disposition, and is cautious and wary in its approaches. All observers are agreed that it is always attended by two pilot fishes, who act the same part as that wrongly assigned to the jackal in reference to the lion—going on ahead to examine any likely object, and returning to inform the shark whether it is of an eatable nature. The splashing of oars, or even of the arms and legs of a swimmer, will often deter the shark from making an attack, and there is every reason to believe that if swimmers in tropical waters would always carry with them three or four hand grenades, they would have little occasion to fear interference from him. It is strange that so obvious a precaution should be generally neglected. The inability of the shark to seize its victim without turning itself first upon its back must be a serious inconvenience to it, and a swimmer with sufficient presence of mind to await its coming, and then when it turns to dive suddenly under it, can baffle the rush of a shark, just as a man can avoid the charge of an enraged bull by coolness and activity. Man's aversion to the shark here stands greatly in his way, few swimmers when attacked possessing sufficient coolness and presence of mind to carry the manœuvre into successful effect, although many possess nerve enough to await without flinching the onset of the most formidable of terrestrial animals. Did we know more of the domestic habits of the shark, and learn to appreciate the virtues that he probably possesses, there can be little doubt that the unreasoning aversion felt towards him would be largely mitigated, and we should come to make due allowance for the pressure of hunger that at times operates to our own disadvantage.

THE SNAKE.

IN treating of the snake it should at once be premised that all accounts of it must be received with a certain amount of suspicion, as representing the views of man as to the snake, rather than the real state of things. It is notorious that no historian, however much he may strive to write without bias, can be thoroughly trusted in his account of matters in which he is a partisan of one side or another. Upon no subject is man more strongly prejudiced than upon that of the snake; and although he may endeavour to do it justice, it is impossible that he should succeed, writing as he does under the influence of a hereditary enmity against it. The transaction in the Garden of Eden is doubtless responsible for much of this feeling among Western peoples; but this would have no influence with Orientals and others who are still in ignorance of the legend, and the feeling must therefore be considered as a natural and instinctive antipathy throughout the whole human race. Whether such a feeling would ever have existed had not a considerable proportion of snakes been provided with poison fangs, is a point that can never be determined with precision; but the probabilities are certainly strongly in favour of the theory that it is entirely to its lethal powers that the snake owes the distrust and hostility of man. In itself there is nothing

that is or should be objectionable in its appearance. Very many species are beautifully marked; their movements are for the most part graceful; and they are admirably adapted in all respects for the life they have to lead. The harmless sorts have frequently been tamed, and are capable of considerable affection for their masters; and even the poisonous kinds, when deprived of their fangs and accustomed to the presence of man, have no objection to be handled, and submit to familiarities without any show of resentment. Unfortunately for the snake, man is not endowed with an instinct that enables him at once to distinguish between the harmless and venomous species, and the consequence is, that in the countries where snakes abound, one of the first things impressed upon the minds of little children by their mothers is, that the snake is a creature to be severely let alone; and even in a country like our own, where poisonous snakes are rare, we are never able in after life to completely emancipate ourselves from the prejudices of childhood. The snake, upon the other hand, has no natural hostility to man. If man places his foot upon its tail it will of course retaliate, but with a few exceptions the snake never goes out of its way to attack man, and will always avoid a contest if the opportunity be afforded to it. Indeed, there is every reason to believe that if man were inclined to be on good terms with it, the feeling would be more than reciprocated. The snake suffers much from cold, and would gladly accept the genial warmth of the human bed, or the human dwelling, were it but made welcome. Even as it is, it does sometimes seek that warmth, with consequences that are frequently unpleasant either to man or itself.

As man has at all times been in the habit of deifying creatures of which he is afraid, it is not surprising that snake worship has existed to a very considerable extent among most of the primitive peoples of the world in localities where the snake is a good deal in evidence, and even among the moderns it is intimately associated with the author of all evil. Among the almost infinite number of legends that surround the snake, and testify to the deep respect in which it has always been held, is that to the effect that earthquakes are due to the movements of a gigantic serpent immured deep down in the centre of the world. Had the snake been gifted with the ordinary powers of locomotion, it is probable that he would have excited a smaller amount of disfavour, but man is given to dislike anything that he does not understand, and the mysterious and silent movements of the snake were to him so unaccountable as to excite antipathy. It is remarkable, however, that the worm, whose mode of progression is somewhat similar, has escaped the same odium. The eye of the snake has unquestionably operated to his prejudice ; there is an entire want of expression about it which baffles the effort of man to penetrate its mask, and to get at the creature's inner nature. Had the snake been endowed with an eyelid and a clear liquid eye, man would have been more inclined to respond to its advances, and to give it the place it requires by his domestic hearth. It is doubtless unjust that the snake should suffer from a defect for which it is not personally responsible, but unfortunately man is not always just in his dealings with the lower order of creation.

The snake varies in dimensions far more than does any other living creature. The dog perhaps approaches most

nearly to it in this respect, but the dog is to a great extent what man has made him by careful breeding and selection ; and yet even in that case the great St. Bernard is not so large in proportion to the tiny toy terrier as is the giant boa of tropical forests by the side of some of the slender little whip snakes. Undoubtedly the snake in prehistoric times grew to much larger dimensions than at present, and skeletons of snakes have been found in America by the side of which the largest existing python is absolutely insignificant. Indeed, they rival in size the largest sea-serpent, as described by its beholders. The serpent that kept a whole Roman army at bay was but a pigmy to these extinct creatures, and man has reason to congratulate himself that they probably disappeared before he had any opportunity of coming into contact with them.

No theory has been offered by men of science why some species of snakes should be provided with venomous fangs, while others have no such advantage, and there have been hot arguments whether the original father of all snakes was or was not so furnished. The balance of probability would certainly appear to be with those who argue that he must have had venomous teeth. Had it not been so, it is difficult to believe that his descendants could by any process of survival or selection have established poison bags in their jaws, with the necessary apparatus for passing that poison through hollows in the fangs. Upon the other hand, it is easy to understand that had the snakes all been originally so furnished, some of them might, either from accident or from incautiously grasping a round stone under the belief that it was a bird's egg, have knocked out their fangs, and that their descendants might have been born without them.

We have, indeed, an example of similar action in the case of the Manx cat, who, being descended from an ancestor which had, either by traps or otherwise, the misfortune to lose his tail, begot a race of tail-less cats, whose descendants have to the present day lacked the usual caudal appendage. If, then, a cat could transmit this accidental peculiarity to his descendants, there can be no reason to doubt that, in some cases, a snake having lost his poison fangs could be the father of a race of snakes similarly deficient.

As might be expected, the largest snakes all belong to the non-venomous species. Being unprovided with the teeth that enabled their congeners to slay their prey or combat enemies, the fangless snakes would naturally devise other means to procure a living. Having no offensive weapons, they would recognise at once that some entirely novel means must be hit upon. They could neither bite nor tear their prey: they could neither stun it with blows, nor, like the crocodile, drown it. It was, we may suppose, to a snake of exceptional genius that the idea occurred of squeezing a foe to death. The idea was, doubtless, received with enthusiasm, but to be carried into effect against any but the smallest of creatures it was clearly necessary that the fangless snakes should attain far larger dimensions than those possessed by any of the species furnished with poison fangs. However, the idea once mooted, Mr. Darwin's system of natural selection would do the rest. The smaller individuals remained small, and from them sprang the blind worm and other species of harmless snakes. The larger individuals paired together, and keeping the one object steadily before them, in time their descendants attained the

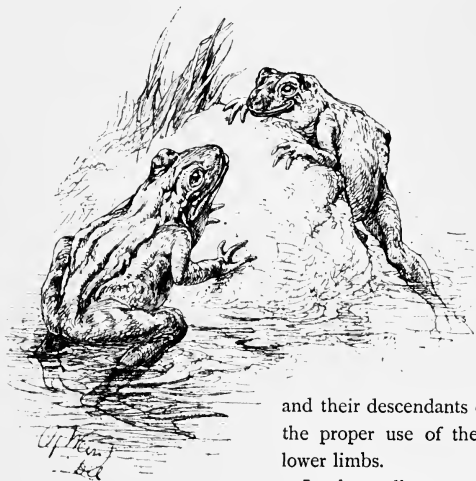
gigantic proportions of the fossil serpents, who could have mastered and made a meal of the Mastodon as easily as the largest boa now existing could dispose of a rabbit. With the disappearance of the huge prehistoric animals, the serpent must have seen that unless he were to perish of hunger it was necessary for him to reduce his size; and by a long process, the exact reverse of that by which he had built up his bulk, he diminished himself to dimensions which, though still vastly greater than those of the poisonous snake, were yet in exact proportion to the size of the animals that were henceforth to furnish him with food.

So far there has been no marked change in the sentiments which man and the snake have entertained towards each other from the earliest times; and it is probable that at no distant date, when man has peopled the world to its utmost limits, the snake will find that it is incumbent upon him to go.

FROGS.

THERE can be no doubt that frogs do not stand as high as they ought to do in the estimation of the world. They are regarded as creatures of little account, and their large mouths and general emptiness have told against them, though why this should be so can hardly be explained, seeing that several human beings possessing precisely the same characteristics are regarded as great statesmen. But these physical peculiarities are, after all, a minor consideration, and the low estimation in which frogs are regarded really arises from an irreparable misfortune which has befallen the whole race—namely, their inability to stand upright. It is this inability which has sunk the frog so low in the scale of creation. Had he possessed the power of standing upright, his striking resemblance to a somewhat stout human being would have been so remarkable, that it is probable he would have ranked even higher than the monkey as a type, if not as an ancestor, of man. Any one who has seen well executed specimens of frogs set up in the attitudes of human beings, must have been struck with the extraordinary resemblance, and a community of frogs capable of walking would undoubtedly be regarded by men as the closest assimilation in the animal world to human

forms and ways. Frogs, no doubt, owe this loss of the power of walking to the persistent habit of their early ancestors of sitting in the water, a habit which, at first, naturally resulted in lumbago, and finally deprived them



and their descendants of the proper use of their lower limbs.

In the earlier ages of the world there is strong evidence that frogs had not lost this power; and the learned may without difficulty assign the origin of all the early legends of pixies, brownies, and dwarfs to the accidental discovery by ignorant rustics of communities of frogs, which had not, as yet, lost the power of walking. It may, of course, be urged that even admitting the existence of troops of little manikins with human motions, this would not account for the

long conversations and strange doings reported of the brownies and pixies, were these nothing but frogs with the power of standing and walking upright. But such an argument fails to take into consideration the united power of superstition and imagination. Have not elaborate ghost stories originated upon no more solid basis than a shadow upon a wall, a fluttering garment, or a wreath of evening mist? Are not the Irish peasantry full of stories of the most detailed adventures with fairies, and are not all popular myths built up on the most slender foundations? The frightened peasant who, returning from work in the gloaming, first came upon a tribe of frogs walking about like human beings, would, upon reaching home, scared out of his senses, magnify what he had seen. Not content with describing the tribe of little men, clad in green and brown jerkins, he would be sure to invent further wonders in the way of conversation, and, as his story spread, so it would grow, until the existence of a race of brownies would become locally believed in. The next rustic who came upon the tribe of frogs would of course outvie the first discoverer in the fulness of his details; and thus we can see how, upon the foundation afforded by the frogs who had not yet lost their power of walking upright, the whole superstructure of brownies, pixies, and elves would naturally be raised.

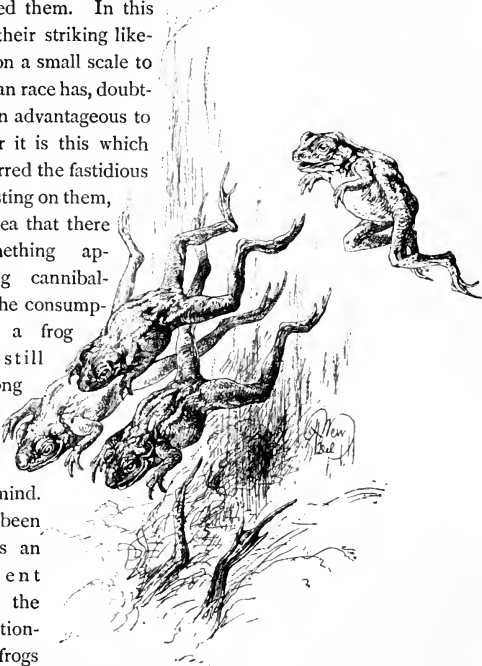
No one who has closely watched the habits of a frog can doubt that he possesses great thinking powers, and a fund of information, inherited or acquired. His habit of sitting motionless is clearly identical with that of the philosophic thinker. There can be no reason why he should so long remain in the same attitude, save that he is meditating.

His weather-wisdom is notorious ; he descries the approach of wet weather long before any change is visible to the duller sense of man. As an athlete he is remarkable, in spite of his comparatively disproportionate girth ; he can leap long distances, and as a swimmer he is unrivalled. Although habitually silent, he is capable of sustaining a lively conversation, and even of singing. These accomplishments he is chary of displaying in this country, having experience of the proneness of the rustic boy to cast stones at him ; but in countries such as Italy, where the boy is less aggressive and the frog more numerous, the force and power with which a tribe of frogs will lift up their voices in chorus is astounding.

It has been the opinion of scientific inquirers that the frog could do a great deal more talking than he does if he chose. Certain it is that a frog, when in danger, such as being played with by a cat, can cry like a child, making himself heard two or three hundred yards away. But it is only on an emergency like this, or when assembled in conclave, that the frog cares to break his customary silence. He acquired the habit undoubtedly during the period of his sojourn under water in the guise of a tadpole. During that period of his life he had neither means nor opportunities of exchanging ideas with his fellows, and the result is the same taciturnity in afterlife that would be shown by a human being deprived during his early years of all friendly intercourse with others. That the frog possesses a strong sense of humour is undeniable. The manner in which he will sit, apparently unconscious of the approach of man, until a hand is outstretched to seize him, and will then, with a whisk and plunge, dive headlong into a pool, and lift his head from

the water at a safe distance, in evident enjoyment of the trick he has played, is a proof of this.

That frogs are dainty eating is acknowledged by all who have tried them. In this respect their striking likeness upon a small scale to the human race has, doubtless, been advantageous to them, for it is this which has deterred the fastidious from feasting on them, —the idea that there is something approaching cannibalism in the consumption of a frog being still very strong in the uncultivated human mind. It has been urged, as an argument against the near relationship of frogs



to the human family, that they build no abodes for themselves; but such abodes would be clearly superfluous in the case of creatures who absolutely prefer being wet

to being dry, who are comfortably clothed in handsome waterproof jackets, and prefer to eat their food raw to cooking it. In some respects the frog has an advantage over the human being. He has no trouble whatever with his family, which is a large one, for, from the first, tadpoles are able to set themselves up in life without assistance from their parents.

Frogs vary in colour and habit in different countries fully as much as do the human race. Although, as a family, they prefer marshy places, some species never go near the water from the time they emerge from the tadpole state until they return to it full of family cares. There are other kinds which make their living among trees, climbing with great sureness of foot, rivalling the leaves in their hue, and feeding upon the insects that frequent them. This power of adaptation to circumstances must be taken as another proof of the intellectual development of the frog, and, had the race received as much consideration from man as has fallen to the lot of many animals, there is no saying to what point their intellectual faculties would have developed. As it is, it cannot be denied that they compare not unfavourably with similarly neglected human beings, and the frog can, at least, claim to be on a level with a Digger Indian.

Whether the frog is endowed with courage is a moot point. He has not, it is true, been seen to dispute the passage of his favourite haunts with wild beasts, or even with horses or oxen; but this may arise from magnanimity as well as from want of courage, and he may feel that, being able to enjoy the pool at all times, it would be unjust to grudge a drink occasionally to thirsty animals.

As to insects, he is less tolerant, and destroys those who venture on the surface of what he considers his water with promptitude and despatch. Enough has surely been said to show that the frog is worthy of vastly higher consideration at the hands of man than he has been in the habit of receiving, and that, were it not for that unfortunate affliction in the matter of legs, frogs would attract great attention from their striking similarity to men, their meditative habits, their powers of concerted singing, and their great athletic attainments. Now that attention has been called to them, doubtless the race will be seriously studied, and it may be expected that it will be discovered that they possess far higher and finer traits of character than has hitherto been suspected.

DADDY-LONG-LEGS.

ONE compensation for the coming of winter is that at that season we are free from the presence of the daddy-long-legs, known to the scientific as *Tipula oleracea*, who comes among us in the autumn in vast hosts, and makes himself as unpleasantly conspicuous as possible by his earnest and persevering efforts to commit suicide in our lamps and candles. This creature is remarkable as being a standing protest against the Darwinian theory of the survival of the fittest. Nothing could be more unfit than this insect to battle for existence ; his flight is slow and weary ; he is incapable of dodging his pettiest foes, and his long, useless legs are everywhere in his way. Had there been anything in the theory, the *Tipula oleracea* would have set to work to shorten his legs, to strengthen his wings, and to attain something of the easy elegance and lightness of movement of his first cousin, the gnat. That it is no fault of his own that he has not done so we may be sure, for evidently the creature is painfully conscious of the clumsiness of his appearance and gait, and is prepared at the shortest of notice to divest himself altogether of the legs which are such an encumbrance to him. The urgency of his desire to commit suicide in the flames is another

proof of his consciousness that he is a painful failure, and that the sooner he terminates his existence the better, and he gladly yields up his life on the smallest pressure between the human finger and thumb. He himself is unable to see, and no one else has been able to discover, the *raison d'être* of his existence. He is certainly not ornamental, nor is he useful. He has no means of defence, and seems to have no joys in his life. He does not appear to have even the pleasure of going to sleep. Other insects are diurnal or nocturnal in their habits, but the *Tipula* is active all day, and about and on the look-out for candles all night. The closest observer has never seen him close an eye. Even in the grub state his existence cannot be a cheerful one, unless he derives a positive pleasure from the act of devouring everything he comes across. For as a grub, he possesses no legs, and no visible eyes; he is a round, wrinkled, tough tube, and one of the most destructive of the enemies of the farmer and the gardener.

Why in one stage of his life this creature should be altogether legless, while in the other he should possess an absolute superfluity of leg, is a problem which has puzzled the deepest thinkers, and it has been suggested that the abnormal stupidity of the daddy-long-legs is caused by his own ineffectual efforts to grapple with the problem. Nature, indeed, has given to him an infinitesimally small amount of brain. While in the fly and the ant the head bears almost the same proportion to the body as it does in the human species, in the *Tipula oleracea* it is not the hundredth part of the bulk of the body; indeed, it is questionable whether in all nature a creature is to be found so badly provided with head. Even the rustic mind, which is slow to recognise

facts in Natural History, views this unfortunate and misshapen insect with good-natured pity and sympathy. The very village boys abstain from tormenting him, partly perhaps from their feelings of kindly contempt; more because he is too slow and stupid for his chase to cause any excitement; most of all because he parts with his legs and wings so willingly that there can be no pleasure in tormenting a creature who does not care whether he loses them or not. The *Tipula* is spoken of by rustics as Gaffer-long-legs, sometimes as Peter—or Harry-long-legs, and is credited with a character for harmlessness and blundering well-meaningness, which is sufficiently well deserved in his state as a perfect insect, but is wide of the mark indeed in his larva stage. The wrinkled tube is one of the most voracious of creatures, and nothing comes amiss to it. The roots of grass, turnips, potatoes, and, indeed, almost all vegetables, are equally welcome. When the villa gardener sees with dismay his cherished little piece of lawn turn yellow and gradually wither up, he knows, or ought to know, that it is the work of the grub of the daddy-long-legs. He had, indeed, in the autumn watched swarms of these creatures blundering about on the grass, taking short flights of a foot or two, and settling down again, but it did not then strike him that each and every one of them was hard at work laying eggs, and that their seemingly meaningless flights were only movements from crevice to crevice in the soil, an egg being inserted in the ground whenever the *Tipula* could find a spot in which she could introduce it. The work of maternity once completed, the daddy-long-legs waits till nightfall, and then hastens to commit suicide at the first friendly light. As many will, if an opportunity be offered, perform this speedy

despatch previous to the deposition of their eggs, those who have the wellbeing of their lawn at heart will do well to light a fire of shavings or other brightly burning stuff in the close vicinity of their grass for an hour or two every evening when the daddy-long-legs first begin to appear in form. They will fly into the flames by thousands. Some may urge that such a method is cruel, but death in a large body of flame is instantaneous. Indeed, ocular demonstration is abundant to show that these creatures, as, indeed, most other insects, are scarcely capable of suffering; for, were it otherwise, it is hardly possible that they should, after repeated singeings, continue to fly at a candle flame till they finally succeed in destroying themselves. Where such measures as this are not taken, and the flies are permitted to deposit their eggs in the soil, the only method of safety is by rolling the ground with very heavy rollers, so as to destroy the grubs, but this has only a partial success, as most of them are too deep below the surface to suffer injury from the pressure.

Birds are valuable allies to the farmer and gardener in their war with the daddy-long-legs, but their numbers are wholly insufficient to cope with the evil. Even the most voracious bird would be choked did he try to stow away more than a certain-sized bundle of straggling legs and wings in his crop. Moreover, the *Tipula* appears at about the same time that plums ripen, and birds greatly prefer stone fruit to daddy-long-legs. As our own taste inclines the same way, we cannot find any serious fault with them on this score. Spiders dispose of a few, but it is remarkable that, awkward and blundering as the daddy-long-legs' flight is, he very seldom intrudes into the meshes spread for him

by the spider. He makes no efforts to avoid a human being, and will fly right into his face with the greatest nonchalance; he will settle in his hair, and cling to his clothes, but he will almost always manage to avoid a spider's web. In the autumn spiders are extremely plentiful, and their webs spread from bush to bush, and from tree to tree, are a perfect nuisance to passers-by. With the nets spread for them in all directions, it is wonderful how the *Tipula* manages always to avoid these snares; for, however thickly they may be swarming in the garden, it will need a very careful search to find a single specimen in one of the webs.

This naturally gives rise to the idea that the daddy-long-legs is a far craftier insect than he is generally assumed to be, and that his awkwardness of gait and motion is assumed merely to gain sympathy and toleration; just as a woman pretends to be an invalid when she wishes to coax her husband into giving her something she has set her mind on. There may be something in the hypothesis, but the smallness of head and lack of brains are against the theory; and we prefer to believe that the insect's power of avoiding the snares of the wily spider is due to some at present undiscovered sense or instinct. The daddy-long-legs has not been used to any extent for edible purposes, but there is no reason why he should not be as good as the locust, who is by no means bad eating. Those who are fond of experiments could easily collect a sufficient number by the aid of a sweep net on any piece of grass during the month of September.

THE APHIS.

INDIVIDUALLY the aphis is insignificant ; collectively the aphides are a mighty army working incessant damage to man. Whether the locust, the caterpillar, or the aphis effects the greatest injury upon the vegetation necessary to man's existence is a moot point. Were the locust to be found in all parts of the world, instead of being confined within comparatively limited regions, the palm would certainly be awarded to it, for the locust spares nothing, and destroys every green thing as its armies march along. The caterpillar and the aphis, although far more widely distributed, are less universal in their tastes, and fortunately neither of them has any partiality for cereals, the great staple of man's food. It may well be believed, however, that were it not that the caterpillar is kept down by the ichneumon, and the aphis by the ladybird and other foes, both would in a very short time multiply so vastly that having devoured every other green thing they would be driven to fall upon the corn crops in their green stage ; for when approaching ripeness the cereals are far too hard for mastication even by the jaws of the caterpillar, while the aphis might as well endeavour to obtain sustenance from a stone-wall. It is needless, however, here to enter into a detailed consideration as to the respective merits, or rather demerits, of the

three insect scourges ; it is enough that one aphid alone is fully capable, if left to its own devices, of developing in the course of a single year into a host so mighty that it would cover the land and wither up and devour all green things. While the caterpillar devours the substance of plants, the aphid only sucks their juices, and kills by so enfeebling the shoots that they are unable to put forth their leaves. It is an awkward, slow-moving creature, with its heavy green body swelled almost to bursting with vegetable juice, supported by legs so thin and fragile that they can scarce hold up its weight ; and yet it seems to pervade all nature, and to appear at its season in vast armies, which fall almost simultaneously, it would seem, upon the plants it affects. So sudden and unaccountable is their appearance, that there are many persons who have maintained, and vast numbers still firmly believe, that the aphid is spontaneously produced from the juices of the plants it affects. The rose-grower will go into his garden and watch the young shoots from the leaves making vigorous progress, and he smiles to himself at the thought of how soon the sprays will be covered with rich blossoms. A cold night comes, followed perhaps by a day or two of dull weather. He shakes his head as he inspects his bushes, and marks how the delicate young leaves are slightly discoloured. He knows what will follow. Two or three days later every shoot is closely packed with a layer of the green fly sucking up its vital juices. It is not surprising that the grower absolutely refuses to believe that the whole of this infinite number of creatures were floating in the air waiting to pounce upon his plants at the very instant when, weakened by the frost, they are the less able to resist its attacks.

What renders the problem still more difficult is that the aphid army is not homogeneous. Each plant has its own tribe that prey upon its juices. The bean aphid differs from that of the rose, and this again from the hop fly; and, indeed, the number of varieties of aphid is exceedingly large. This greatly adds to the difficulty of explaining their simultaneous appearance in such countless numbers, for it would be necessary to imagine not only one army of aphides ready to sweep down upon vegetation weakened by frost or east wind, but a number of them, each selecting the particular plants they love, and rejecting all others—one hovering round the town looking out for the rose-trees in its suburbs, another scouring the rural districts in search of beans or peas, a third biding its time until drought or long spell of wet weather shall have weakened the hop vines to a point when they may be in a condition to suit its palate. It must be remembered that their appearance upon a certain plant is not gradual, but almost simultaneous. A week after a sharp frost on a May morning the whole of the rose growers in the district affected by the frost will find their plants attacked by the aphid, while the wail of the hop growers at the appearance of the fly will rise simultaneously over a whole district. The scientific explanation is that the appearance of the aphid in such vast numbers simultaneously is due to its prolific nature, but the practical man refuses to credit the suggestion. The aphid is prolific, but not prolific in the same way as is the white ant. The aphid will produce twenty-five offspring daily, but this will not account in any way for the fact that within a day or two of the pest making its appearance hundreds of thousands are to be found on every rose bush. Could the female aphid, like

the termite, produce eighty thousand per day, the argument that the whole of the rose trees in a garden have been covered by the offspring of comparatively few females who found their way there might be accepted readily enough; but the rate of increase is incredible when we know that each female can produce but twenty-five young in twenty-four hours. It would need, then, not a few, but an infinite host of winged females, to account for the phenomenon. That many may pass the winter as eggs in the bark of trees and other places may be granted, but no one has yet observed the vast hordes streaming out from their places of concealment ready to start off in search of peas or beans, roses or hops. Moreover, in seasons favourable to vegetation, when neither frost nor east winds nor prolonged wet nor drought weaken the plants, and they grow robust and strong, what becomes of the armies of green fly that would, had the vegetation been sickly, have pounced down upon it? Nothing could be less scientific than these arguments, but as somehow there is common sense in them, they commend themselves to the minds of the foolish multitude, who, in spite of the teaching of their instructors, still believe the evidence of their own eyes that the aphis is the product of a certain unhealthy state of the juice of plants.

But although the increase at the rate of twenty-five per day by no means accounts for the almost simultaneous appearance of countless millions, it is a ratio that unless checked would by the end of the season absolutely cover the face of the earth, for the young ones so speedily become mothers that it is calculated the descendants of one aphis will during the season number 5,904,900,000. One objection on the part of scientific men to the

spontaneous generation theory is that the aphis in other respects is an exception to the general law that governs the lives of all other creatures. It is not necessary for the aphis to have a father. The aphides that appear in spring are all females, and the process of multiplication and re-multiplication goes on with as much regularity as if the male sex had no part whatever in the economy of the world. It is only late in the autumn that the males appear, and it is not until after pairing that the females take to laying eggs, all the previous generations having been born alive. It is clear that when treating of a creature so unique in its habits and ways, the word "impossible" should never be used even by men so absolutely sure of what they assert as are scientific men. It is well, indeed, for man that the six thousand million possible descendants from each spring aphis do not put in their appearance. Happily nature, while in a moment of light-heartedness producing creatures possessed of such extraordinary powers of multiplication, and of no visible place or advantage in the general scheme of creation, thought proper to furnish them with a vast number of foes, whose life should be spent in ceaseless efforts to counteract the effects of this fertility. Chief among these stands the ladybird, but there are numerous others almost as indefatigable and voracious, even without counting man, with his tobacco juice, soap-suds, and fumigating apparatus. Nature has handed over the aphis defenceless to its destroyers. It possesses neither jaws nor sting; it is unprovided with armour, it cannot coil itself up like a wood louse, or assume a threatening aspect like the Devil's Coach-horse. It is simply a helpless and unresisting victim, whose destiny is to do as much damage as it can to vegetation, and then

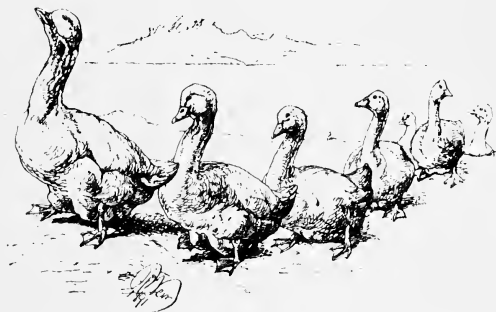
to be slain. The closest observers have been unable to detect any signs of playfulness or of any other form of enjoyment in the aphis. Its existence is as monotonous as that of the vegetable the juices of which it drinks, and from the juices of which it is popularly believed to have sprung.

GEESE.

NO thoughtful man who believes in the transmigration of souls can doubt for an instant that those of military men pass a portion of their period of change in the bodies of geese. Of all birds it is the most military; its carriage, habits, and customs all point to its being animated by a spirit which in some former phase of existence has passed through the hands of a drill sergeant. Whether walking, swimming, or flying, the goose shows its military instincts. It carries its head well upright, with a certain amount of stiffness, which speaks of reminiscences of the military stock. It advances with its comrades in solid phalanx, and even when feeding preserves the same order, and holds itself in readiness for instant action. A similar formation is preserved while swimming and flying, although in the latter exercise the goose prefers travelling in single file, each member of the column preserving its distance accurately, and keeping itself in readiness to range up in close order should necessity require such a movement.

The watchfulness of the bird is proverbial. In their wild state sentries always keep guard over the feeding flock, and at night it is easier to surprise a house guarded by the most wakeful of watch-dogs than to approach one around which geese have taken up their quarters. The fact that geese

saved Rome by giving warning of the approach of the Gauls while the watch-dog slept is historical, and the goose was ever afterwards honoured by that military people. Even now the goose is employed in many places as a watcher, and there are many nurserymen in the neighbourhood of London who keep two or three geese in their gardens to give notice of the approach of marauders upon their fruit and flowers. It is singular, indeed, that they have not been utilised still



further in this direction. They certainly have the drawback that, however great their valour, they are not feared by the armed burglar as much as is a savage watch-dog ; but, upon the other hand, they can be cheaply kept, and can bring up a family which can be turned to other purposes than that of sentinels. Of all birds they are the most courageous ; the gallinacæ, and, indeed, many other birds, will fight fiercely among themselves, but they rarely exhibit valour against other creatures, and are almost universally afraid of man. The goose, on the contrary, is of mild temper with

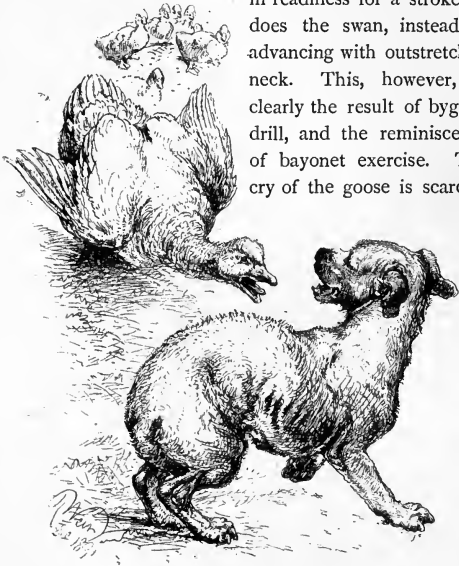
its comrades, and it is rare indeed that quarrels of a serious nature arise even in a large flock of them ; but they have little fear of other creatures. They will close up together and face a dog, and will fiercely resent the approach of a bull to their feeding ground ; they will attack even a good-sized boy who ventures to interfere with them, and although they will retreat before a man, they do so in good military order, showing a brave front as they fall back, and ready instantly to assume the offensive if an occasion offers itself.

In its wild state the goose is an aquatic bird, but when domesticated among us it prefers the dry land to the water ; even when a pond is handy for its use, it passes but a very small portion of its time upon the water, and depends principally for its sustenance upon what it can pick up on the land. It has doubtless observed that the horse, the bullock, and the sheep, who stand high in the estimation of man, obtain their sustenance by grazing in the fields, and has therefore abandoned its family habits of feeding upon marine plants and insects, and has taken to grazing. It retains its web feet, however, so as to be in readiness for any contingency that may arise. This adaptability to circumstances has given rise to the supposition that the military spirits inhabiting the bodies of geese belonged in their lifetime to the gallant corps of marines, who always distinguish themselves equally by land and sea. The goose has suffered grievously owing to the popular, but altogether erroneous, belief in its silliness. How this belief—as expressed by calling a child a silly or a stupid goose—first originated has never been explained, for there can be no doubt whatever that the goose possesses an intelligence far above that of average birds.

Under ordinary circumstances the goose is dignified in its deportment, and there is nothing that so angers it as to be hurried. Under such circumstances its movements are awkward, and when compelled to walk much faster than its ordinary gait, it is often on the verge of falling on its nose—a misfortune which does not, so far as we know, happen to any other bird or beast under the same circumstances. It is the consciousness, no doubt, that its appearance when so hustled borders on the ludicrous that excites the anger of the goose, for it is to be observed that after such an exhibition it is a long time before it recovers its usual placidity of demeanour. At times geese have shown themselves capable of strong personal attachment to their owners, following them about like dogs, and abandoning their usual habits of military evolution with their comrades. This clearly enough points to the fact that these geese were, in their former state, soldier-servants, whose duties lay in personal attendance upon officers, and were never of a military character.

Unlike the hen, the female goose is not perpetually roaming about laying eggs. In the proper season she lays a sufficient number for the perpetuation of her race, and brings up a family more or less carefully; but even in this matter she does not exhibit the perpetual fussiness of the hen. She allows her young ones considerable freedom of action, but is ready in their defence to face the largest dog, and to oppose a threatening and formidable demeanour even to a human being whom she suspects of aggressive intentions towards them. So courageous is her attitude under such circumstances, that even the fiercest dogs will turn tail before her onslaught, and the ordinary boy, al-

though he may pretend to deride her anger, will keep at a respectful distance from her. Undoubtedly the goose when attacking would have a more dignified appearance did it keep its head back in readiness for a stroke, as does the swan, instead of advancing with outstretched neck. This, however, is clearly the result of bygone drill, and the reminiscence of bayonet exercise. The cry of the goose is scarcely



melodious; its hissing is almost peculiar to itself, its congener, the swan, being alone with it in the possession of the faculty of raising this angry and threatening sound. A flock of geese advancing to the attack, hissing

loudly, are sufficiently alarming to the average woman, and terrifying in the extreme to a child, and even animals vastly superior in bulk and strength exhibit signs of trepidation when thus assailed. As might be expected, the goose is not particular as to its rations, and will eat anything. It will browse upon water weeds, it will graze on grass, it delights in corn, and will eat scraps of any kind of food. The final result of all this is eminently satisfactory. It is doubtful whether any kind of bird affords such excellent eating. Were the goose a rare bird, and its flesh so costly as to be seen only on the tables of the wealthy, it is probable that it would be considered as the very greatest of luxuries. Owing, however, to its numbers, and the manner in which it picks up its own living, it requires but little outlay in its rearing. Its flesh is so plentiful that at certain seasons of the year it can actually be purchased at a lower rate than butcher's meat. At Christmas time geese can be bought in London at sixpence a pound, and the goose can fairly claim to be the working man's greatest luxury in the way of food.

Although fashion has ordained that the turkey shall occupy the place of honour on the Christmas board of the well-to-do, the flesh of that bird is dry and tasteless in comparison to the juicy and well-flavoured meat of the goose. But, in addition to supplying man with some of his most tasty food, the goose also bestows upon him the most comfortable of beds. It is true that the hand of innovation has produced many contrivances of steel and iron, with complications of springs, to produce the same effect of elasticity as the bed stuffed with good goose feathers, and it may be owned that in summer time the

spring bed possesses certain advantages, but in the depth of winter it is a poor substitute for the warmth and cosiness of the feather bed. Altogether, the goose deserves a far higher place than it really occupies in the esteem and affection of mankind. Its courage and military habits render it admirable when alive; its flesh and its feathers should win for it our warmest regard after its death.

SLUGS.

ALTHOUGH the slug is not generally classed under the head of *feræ naturæ*, it is in the summer time of the year hunted extensively, and with the greatest assiduity. The chase is kept up, indeed, in every garden in England, but it is in the villa gardens of London that the hunt is most actively pursued. It is not that the hatred towards the slug is stronger there than elsewhere, but its depredations are more noticed and cause greater annoyance. In a large country garden, although the head gardener may gnash his teeth when he finds that heavy raids have been made upon his beds of petunias or his tender young vegetables, the damage done is comparatively so small that it is scarcely noticed. But the ravages committed in a villa garden catch the eye at once. The possessor, if fond of his little domain, knows every plant in it by sight, and when he finds a dozen of his pet seedlings—raised under a handlight, watched, watered, and tended with pride and pleasure—lying upon the ground, eaten off a quarter of an inch above the surface on the very morning after being planted out, his heart is filled with grief and rage, and he becomes from that day a determined slug-hunter. This pursuit is a fascinating one; undertaken at first from a thirst for vengeance, it is soon

pursued for its own sake. Many high qualities are requisite for marked success in the sport. It requires watchfulness, patience, ingenuity, a knowledge of the habits of the prey and of its likes and dislikes, and a certain intrepidity as to the risks from night air and damp feet, for it is only when the ground is moist that anything like a good bag can be hoped for.

The slug is as defenceless as the pigeon, and no greater share of courage is required for slug hunting than for pigeon shooting; but whereas the one amusement is a slaughter of innocents, the other is the destruction of ravening beasts, and stands therefore in a far higher category. The slug trusts neither to speed nor fierceness; we know from story how his cousin, the snail, when attacked, put to flight a troop of tailors, by the exhibition of his horns, or, as the scientific would tell us, of his eyes on their upreared stalks. But if the slug possesses eyes, he makes no show of them. We are aware that he possesses a rudimentary shell, which he carries somewhere in his body, and it is possible that he stows away his eyes with equal care.

Secretiveness is, indeed, a strong point in his character, and it enables him to hide himself with such marked success that, until he chooses from hunger or inclination to walk abroad, he can defy the most careful searcher. The slug, unlike the snail, leaves a trail behind him, and this remains visible for hours. The creature is fully aware of the danger which this shining evidence of his passage would entail upon him, but his native craft enables him to baffle his pursuers. As the fox doubles across his trail to throw off the hounds, so does the slug

upon his return to his hiding-place at daylight double and twist until his trail is a very labyrinth which Dædalus himself could not solve. Men have been known in the enthusiasm of the chase to sprinkle finely powdered charcoal over a trail of this kind. The use of a bellows removes all the particles save those adhering to the shiny trail, which is thus rendered permanent, and can then be studied at leisure. But even under these favourable conditions the problem has proved insoluble, and medical men cannot too strongly dissuade their patients from undertaking a pursuit which experience has shown will eventually terminate in madness.

People who write books about gardening give instructions for guarding plants from snails, and often recommend a circle of sawdust, soot, or lime to be spread round each plant. The villa gardener knows that one might as well try to keep a fox from a hen-roost by making a chalk mark on the door. He has tried the experiment. He has spent hours, and nearly broken his back, in applying these pretended remedies, and in the morning his most cherished plants have fallen before the destroyer. He knows that there is no prevention, and that the only cure is the persistent hunting down of the enemy. There are various methods of attaining this end. Pieces of orange peel, if laid on the ground, may be searched in the morning with a fair chance of success; for the slug is so fond of them that, instead of returning to his home at daybreak, he clings to them, and may be found underneath, gorged with over-much eating. Pieces of board six or eight inches square, pressed firmly into the ground, are a good trap, as these keep the soil beneath them moist, and the slug loves moisture and takes

refuge under them. Much execution may be done by these and similar traps, but the enthusiast regards these devices with contempt, for he knows that the enemy may be thinned but that he will never be exterminated by such means. The legitimate sport is the night hunt, the search, by the light of a lantern, of cabbage or lettuce leaves cast down in the favourite haunts of the slug. On these, on a warm night after a light rain, it may be found by the score—of all sizes, from the tiny glistening speck no larger than a pin's head, to the full-grown animal as long and as thick as a man's little finger. The slug-hunter recognises two species of slugs. There are others he knows, notably the great black slug of the woods, but these concern him not. The two garden species are the white slug, slimy, active, and enterprising, thin in figure, and seldom over an inch in length; and the brown slug, very much larger and heavier, short and dumpty in figure, triangular in section, only slightly slimy to the touch, and with a coat of the toughness of india-rubber.

Hitherto all efforts to turn the slug to profitable use have failed, and mankind have been content to destroy without utilising it. The snail, we know, makes a good and nourishing soup, and nothing but prejudice prevents it from becoming a valuable article of food. But the snail, living as it does in its shell, has but a soft skin, while the slug possesses a coat of extraordinary toughness, which would seem to be an obstacle in the way of its ever becoming useful for culinary purposes. Inventive minds have suggested other uses for it. An enthusiast was convinced that the slug would make an admirable glue, while another has pointed out that the skin of large specimens, carefully

tanned, would make imperishable fingers for gloves. The latter idea has never yet been carried out, owing to the impossibility of finding any material of equal durability and toughness for the other portions of the glove.

All efforts to tame or educate the slug have been vain. It has, indeed, been used by showmen at fairs to spell out names from letters scattered at random on the stage; but it is well-known that the creatures were directed to the desired letters by small pieces of cabbage-leaf fastened beneath them. The exhibition was abandoned, owing to the slowness of movement of the creatures, as they took no fewer than four hours to spell out a word of five letters, and audiences grew tired before the conclusion of the performance, and did not stay to obtain the full value of the penny paid at the door. But although, so far, the slug has failed to afford either profit or gratification to man, its existence cannot be termed a failure, for there can be no doubt that, although unprovided with visible eyes, feet, or other organs, the slug manages to enjoy itself vastly. It has a keen scent, and a most discriminating appetite; its food is abundant, and costs it nothing. Although it can eat and enjoy cabbage leaves, it has higher tastes. For young melons and cucumber plants it has the keenest relish, seedlings of all sorts it loves, and the more rare and valuable the better it likes them. The slug is, in fact, a gourmand, and it is the delicacy of its palate which proves its ruin. Did it content itself with the abundant cabbage or the full-sized lettuce, men would not grudge it its share, and none would trouble to hunt it with lantern and traps; but it is its fastidiousness of appetite, its craving for the young and the rare, its weakness for the quarter

of an inch next to the ground of the stalks of seedlings, which sets vengeance upon its track, and causes it to be hunted to extermination. At present, however, the end is apparently far off; for in spite of its foes the slug flourishes exceedingly, and whatever be the prospects of other game, it is likely to afford sport for the suburban gardener for generations to come.

THE PIG.

SO accustomed are we to the pig in his sty that we are apt to forget that he is naturally one of the most valiant of animals, a sturdy and desperate fighter, able to hold his own against most wild beasts, and ready to face man and to die, fighting valiantly to the last, in defence of his wife and offspring. Whether the pig has improved or deteriorated under the hand of man depends upon the point of view from which he is regarded. Those engaged in consuming the succulent ham, or the crisp rasher, would, doubtless, reply in the affirmative; while the Indian officer, on his return from a morning spent in the fierce and hazardous sport of pig-sticking, would utter as decided a negative. Between the wild boar and the domestic pig the difference is as wide as between the aboriginal Briton and the sleek alderman; and, in both cases, though civilisation has done much, eating has done more to bring about the change. Gluttony is undoubtedly at the root of the pig's present condition and status. It cannot be called a gourmand, for it is not particular as to its food, and demands quantity rather than quality. It is content to eat and to sleep alternately, and the whole energy of its naturally vigorous disposition is devoted to putting on fat.

The consequence is, it is ready for market at almost any period of existence. Whether as the toothsome sucking-pig or as a venerable great-great-grandmother, the pig is, after a period of repose and extra feeding, equally appreciated as an article of food. Other animals become tough and lean in old age; the pig knows its duty to man better than this, and is ready at all times of its life to bring itself into the condition fitted for the knife. In his wild state

the boar is swift of foot, clad in a coat of coarse, thick hairs, with bristling spine. His tusks are very formidable weapons, and he can use his strong forelegs to strike with effect. Even the royal tiger will shun a contest with this



sturdy warrior, unless absolutely driven to it by hunger. His cousins and relations all share his courage. The peccary of Mexico, small as he is, will when in bands attack the jaguar, or even man, with absolute confidence, and, although many may fall in the assault, will, in either case, almost certainly prove the conqueror in the end; while the wild pigs of Paraguay are equally fierce and formidable, and, having driven a hunter into a tree, will remain round it, and refuse to retreat until scores have fallen by his rifle, or until they are driven away by hunger.

The domestic pig, like the Britons when under the tutelage of the Romans, would seem to have lost his warlike virtues, were it not that there still lingers in his wicked little eye an expression of savage defiance that speaks of a consciousness of latent power ready to break into open war did he see a prospect of emancipating himself from his degrading slavery.

There is a prejudice against the pig because he is dirty. It is difficult to imagine a more unreasonable one. He is kept by man in a filthy sty, penned in within the narrowest possible limits, and deprived of the decencies of life. Under such circumstances, it is practically impossible that he could be otherwise than dirty. As in his wild state he is protected by a coat of smooth bristles from the dirt, nature has not bestowed upon him the long and flexible tongue that enables the dog and cat tribe to clean themselves. His short neck, too, renders it impossible for him to reach the greater portion of his body. The fact that his skin becomes dirty from the conditions under which he lives would matter comparatively little, so far as the estimation in which man holds him, were he covered with hair. Man is tolerant of dirt when it is not brought prominently under his notice, and it is the height of injustice to blame the pig for a hairlessness which is solely due to the fact that he is kept in comparatively warm quarters. The pig of Italy and Sardinia, which for the greater portion of the year picks up his living in the forests in a state of semi-wildness, is still well clothed with hair; and, indeed, it is only when kept entirely in confinement, as with us, that he almost wholly loses his natural covering.

The pig is an eminently vocal animal, and even in the

bosom of his family he maintains a steady, if to man monotonous, conversation. He possesses a large variety of notes, in this respect far surpassing any other animal. The cat has an extensive register, but principally among the high notes ; while the pig's tones embrace the whole gamut, from the deep grunt of discontent to the wild shriek of despair. Properly educated, the pig should be capable of vocal triumphs of a very high kind, its upper notes being as clear and no more unpleasant than the corresponding ones of an operatic soprano, while the lower ones would be the envy of a basso profundo. It is a little singular that no persistent effort should have been made to utilise the pig's vocal powers in this direction, although he has at times been taught to spell and to perform other feats requiring as high an intelligence as that of singing.

The pig is capable of adapting himself to all and any circumstances in which he may find himself. In Ireland it complacently accepts the position of a member of the family ; in Africa and the East, where flesh is not in demand, and no one takes the trouble to fatten him, he readily assumes the office of scavenger in general, and performs that *rôle* admirably. No one has yet, so far as we are aware, adopted the pig as a drawing-room pet ; and yet, if tended with the same care bestowed upon the lap-dog, there is no reason why he should not shine in that capacity. His tail is fully as curly as that of the pug, his skin may compare not unfavourably with that of the shaved poodle, while in point of sprightliness he is, at any rate in his younger days, superior to the bulldog. He would not run up curtains like a kitten, nor knock down valuable ornaments from the chimney-piece ; while he might, doubtless, be trained with very little

trouble into becoming an efficient guard in the house. He is certainly capable of affection, and, as all acquainted with his habits are aware, has pronounced likes and dislikes.

In the East the pig is viewed with extreme abhorrence, or, at the best, with contempt ; but as he shares this feeling with the dog, it must be regarded rather as a proof of the want of perspicuity on the part of man than of any demerit on that of the pig. The pig does not naturally take to the water, and it would have been well had he been, like the dog, encouraged to do so, for when once fairly driven to it he is a good swimmer ; and the popular belief, that he cuts his own throat with its fore feet, is, like many other popular beliefs, wholly erroneous, although it is true that he will sometimes, in his first flurry at finding himself in an unaccustomed element, scratch his cheeks somewhat severely.

In the early days of our history the pig formed an even more important article of food than he does now. The swineherd was a much more common personage than the shepherd ; and, indeed, at a time when the greater part of the country was covered with a dense forest, sheep must have been comparatively few and rare. In all the descriptions of the banquets of our forefathers swine's flesh stands in the very first position, and seems to have been a much more common article of nutriment than beef. The pig, indeed, affords a great variety of food. The boar's head, properly garnished, is a lordly dish ; brawn has always been regarded as a delicacy ; and pig's flesh is good whether boiled or roasted, salted or smoked. The pig can be eaten almost to the last scrap, for his feet are edible, chitterlings and tripe are relished by many, and from his superabundant fat we have the lard so useful to housewives.

His skin furnishes an excellent leather. His bristles are unrivalled for the manufacture of brushes. Our ancestors showed their wisdom in the warm appreciation of the pig, and no small proportion of our cousins, the Americans, exist almost entirely upon his flesh. The pig is an admirable emigrant, and appears to be almost indifferent to climate, flourishing wherever it has been introduced—from the sunny islands of the South Seas to the rigour of a Canadian winter. So that it can be given sufficient food or obtain it by foraging, he is contented, and applies himself vigorously to the work of putting on flesh and rearing frequent and extensive families. The contempt with which the pig is too generally regarded should be exchanged for a respectful admiration of his numerous and varied excellences.

CATERPILLARS.

BUTTERFLIES and gnats, bees, ants, flies, crickets, and many other insects, have inspired writers of poetry or prose ; but up to the present time, as far as we know, no one has made the caterpillar his theme. Yet, closely examined, many of the caterpillars are well-nigh as gorgeous in their raiment as the most beautiful of butterflies. The caterpillar is free from the flippancy and vanity of the butterfly—who spends by far the greater portion of its life in play and flirtation ; it has business to do, and does it conscientiously, and is indeed a character to be admired, save in the matter of the destruction of choice vegetables, for which, after all, its mother, who deposited the egg upon them, is, in fact, solely responsible. The caterpillar is infinite in its variety of hue, but chiefly affects black, ashen grey, and white, bright greens, yellows and browns with rich bands or blotches of white, yellow and scarlet, and indeed almost every variety of brilliant colour. Sometimes it is soft, smooth, and hairless ; at others covered with a short, thick, silken coat like velvet ; and occasionally bristling with long, stiff hair, a very porcupine among its fellows. Caterpillars from the time they are born give evidence of the possession of two predominant faculties, the one an all-

devouring appetite ; the other, the knowledge of constant danger and the efforts to escape the eye of their teeming foes. This they do in accordance with varied instincts inherited from progenitors.

Some will hide on the under side of a leaf, others will eat into its substance, and establish themselves a domicile between the outer and inner tissue, proceeding at once to enlarge their house and to satisfy their appetites. Others, on the approach of danger, will curl themselves up, and drop to the ground, trusting to fortune to fall between two clods of earth, but, in any case, shamming death until the danger has, as they believe, passed away. Another kind, a greyish-brown in colour, and rough and knobby of skin, will stand upright, imitating so exactly the appearance of a little bent twig, that the keenest eye would fail to detect the difference ; while a great many caterpillars guard themselves against unpleasant surprises by establishing themselves from the first in a place of concealment, and there passing the greater portion of their lives. When, as not unfrequently happens, the chosen hiding-place is in the heart of a bud just beginning to form, the results are naturally the death of the flower, and extreme exasperation upon the part of its owner. There is nothing pugnacious about the caterpillar, all its means of defence being more or less passive in their character. A not inconsiderable section no sooner leave the egg than they set to work to form themselves a shelter by turning over the edge of the leaf, and fastening it with silken threads, so as to form at once a house and a hiding-place. Lastly, there are the caterpillars who live in communities, and establish a rampart against their foes by throwing round their dwelling-place a thick curtain of silken

threads, through which their insect foes cannot break, while even birds seem to hold it in high respect.

The mission of the caterpillar may be considered as two-fold: he has to reach the chrysalis stage, from which he will emerge as a butterfly or moth, and then perpetuate his species; and he is an admirable machine for the conversion of vegetable matter into a form in which it can be digested and relished by birds. He stands to the feathered world, indeed, in exactly the same position that the ox and the sheep occupy in relation to man. Although partial to seeds and fruits, birds are not vegetarians in the broad sense of the term, and many would starve had they nothing but leaves, whether of the rose or the cabbage, to devour; the caterpillar then comes to the rescue, and forms the intermediary link. He possesses an appetite of extraordinary voracity, and in the course of his not very long life eats many hundred times his own weight of vegetables, and converts them into a rich and luscious food for the birds. It may be said that, in some respects at least, the instincts of caterpillars must be defective, or, knowing that their plumpness is their danger, they would eat less. This is no doubt true, but as it is true also of sheep and bullocks, it can hardly be made the subject of reproach to the caterpillar.

But, after all, vast as is the number of caterpillars who go to feed the birds, it cannot be said that birds are by any means their chief enemy. Their great foe and relentless exterminator is the ichneumon, against whom none of their cunning devices of concealment avail, for he can discover them unerringly in their inmost lurking-places. The ichneumon varies in size as greatly as does the caterpillar himself.

Some of them are as long as wasps, although with a slender body, no thicker than a bodkin ; some so tiny that they can scarce be seen with the naked eye ; but all are alike in their habits. Watch one, large or small, as he settles upon a leaf. Straightway he begins to hunt up and down with quick eager motion, like a dog quartering a turnip field for partridges. Up and down, below and above, prying into every cranny, he hunts, hurrying from one leaf to another until he finds a caterpillar. He wastes no time with him, but thrusts the long ovipositor through the skin, and places an egg there snugly. He repeats this two, three, or half a dozen times, according to his own size, and that to which the caterpillar will grow. His young ones must be fed where they are hatched, and it would not do to lay more than the caterpillar can support. What the sensations of the caterpillar are when thus treated no one has so far attempted to explain. It gives a little wince each time the operation is performed, and then pursues its vocation as quietly as if nothing had happened. There can be little doubt that it is profoundly discouraged ; it must feel that all its efforts to elude the foe have been wasted. It doubtless knows that it has received its death wound, that it will never soar in the air as a bright-winged butterfly, and that its chrysalis state will be its last. It speaks well, then, for the sense of duty of the caterpillar, that it goes as doggedly on as before, eating as largely and steadily as if nothing had occurred, and showing no sign of pain or disturbance at the birth of foes, who soon begin to gnaw away at its interior. It is to be hoped, indeed, that it suffers but slightly. The organs of the caterpillar are simple. It is little more than a tube, and it is probable that its sensibility

is slight. Still it is inevitable that it must suffer more or less; but it goes on until, just as it is about to assume the chrysalis state, or shortly after it has done so, it dies, and the little ichneumons make their way through its skin, and, after a brief repose, fly away to recommence the deadly work of their parents. It is calculated that fully 80 per cent. of caterpillars are slain by ichneumons.

The caterpillar is distinguished for its imperturbable good temper; no one has yet witnessed a good stand-up fight between two of them. Even when browsing in hundreds upon a leaf, each caterpillar continues its work of eating, wholly regardless of the multitude feeding around it. Its fellows may press it on every side, or walk across its back, without its evincing the slightest sign of irritability, or even dissatisfaction. It may be said that, after all, this host are its brethren, and that the nearness of the family tie produces this feeling of universal benignity. But family ties are not always found to have this effect, even among human beings, and, moreover, the caterpillar's good temper and forbearance extend to individuals of entirely different species and families. The largest caterpillar coming across a small one makes no attempt to bully or interfere with it, and the whole race appear to be imbued with a spirit of admirable courtesy and gentleness.

The caterpillar, in confinement, develops qualities of a quite distinct nature to those which it exhibits in the wild state. The silkworm caterpillar, for example, is intolerant of noise of any kind, and the most absolute silence is maintained in the feeding house. It is not that noise excites irritability or anger, but it fills it with such disgust that it falls ill and speedily dies. Gardeners would be

gratified, perhaps, were the wild caterpillar equally susceptible ; as, in that case, two or three discharges of a gun would extirpate the whole race throughout the extent of a garden. The caterpillar is clearly worthy of much greater attention and study than it has yet received ; and as we are told to look to the ant and the bee as examples of patience and industry, so we may advantageously take a lesson of courtesy and good temper from the hitherto little regarded caterpillar.

THE DOMESTIC FOWL.

THE males of the gallinaceous family may be regarded as types of what is best and most chivalrous in man, and the cock bird of the variety that has become domesticated by man has lost none of the qualities that distinguish his wild congenitors. He is among birds what the knight of chivalry was among the herd of humanity in the Middle Ages. Splendid in his appearance, erect and martial in gait, proud of his prowess, fierce in battle, ready to die rather than acknowledge his defeat, he is yet the mirror of courtesy among his dames. Not only does he guard them from all foes, but he watches over their safety with anxious care, leads them to the spot where food is the most abundant, and will even scratch the ground to procure dainties for them. He possesses, too, the faults of the human type ; he is needlessly quarrelsome, and prone to take offence ; he will challenge to combat a distant stranger with whom he has no dispute whatever, and will fight for fighting's sake, while, if victorious, he indulges in a good deal of unseemly exultation and boasting at the expense of his foe. Whatever his hue, whether clad in brilliantly-coloured panoply or in burnished black, the cock is the type of the true warrior, with his bright eye, his martial mien, his readiness for battle, his obstinate courage, and the display

of a certain foppery in the care that he bestows upon his appearance. While other birds fight with beak and wing, the cock is furnished by nature with a dagger, a formidable weapon, especially in that branch of the family in which the martial qualities are carried to their highest development—the game fowl. The cock can use his beak with effect, but it is upon his spur that he mainly relies for victory. Throughout the whole of the gallinaceæ the same characteristics are observable in a



more or less marked degree. The male of the pheasant, grouse, blackcock, and their numerous cousins and relations, are all pugnacious to a degree, proud of displaying their airs and graces to their wives, and ready to answer the most distant challenge uttered by another male.

The period at which the fowl was first domesticated is lost in obscurity. The early Greek writers mention it as a bird held from remote antiquity in high honour, and Peis̄thetærus says that it is called the Persian bird, and at

one time reigned over that country. It is to the East, then, that we must look for the ancestors of the domestic fowl, although it is not known how the breed was introduced into Greece or the South of Europe. It may either have come through Northern India, or Persia, or have been introduced by Phœnician traders. It figured early on Greek and Roman coinage, and was carried in the public shows of those nations. It was dedicated by the ancients to Apollo, Mercury, Æsculapius, and Mars and the Romans, good judges in matters gastronomic, had already discovered that it was best when fattened and crammed in the dark. Probably the Phœnicians brought it to Britain when they came for tin; at any rate, it was here before the invasion of Cæsar, who tells us that the Britons abstained from tasting the hare, the cock, and the goose, although they bred them for pleasure—probably, in the case of the cock, for its fighting powers. As poultry have been found domesticated in widely different localities, among peoples having no communication with each other, and even in islands in the South Seas, which must have been cut off from communication with the mainland for vast periods of time, it is evident that their domestication must have taken place in the very earliest times, or that there was a natural fearlessness and a desire for man's companionship on the part of the fowl that marked it out as specially adapted to be his servant and purveyor.

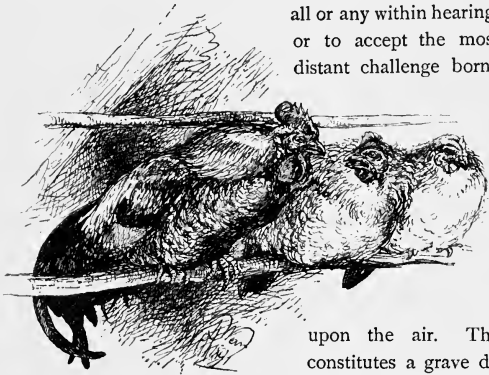
The hand of man has brought about many changes in the bird by the intermingling of species, by careful breeding to render accidental peculiarities permanent, and by other methods; by these a great variety of breeds have now been established differing widely from each other in size and

plumage. The breed in general, doubtless, owes its popularity partially to its appearance and courage, but still more to the flavour of its flesh, its great power of increase, and to its productiveness in the matter of eggs. Other birds lay as many eggs as they desire to have offspring. The hen is less selfish, and will produce a vastly larger number of eggs than she is able to hatch. As the wild bird is not so prodigal, it can only be supposed that this fecundity in the matter of eggs is upon the part of the hen a proof of gratitude for the food she receives from man, a trait which, in itself, should place her high in man's estimation.

While the cock is, above all things, a warrior, the hen is the type of the careful housewife and affectionate mother. Nothing can exceed the care and attention she bestows upon her young—feeding them, guarding them, and teaching them with constant attention, and with occasional chidings when disposed to wander from her. She is no gadabout, and her whole thoughts are centred upon her duty. But although so affectionate a mother and submissive a wife, the hen is mindful of her position as the spouse of a warrior; and as the wives of the knights of old would, on occasion, don armour, and in their husbands' absence defend their castles, so the hen is ready, when danger threatens, to face boldly the dog or the hawk in defence of her children. Neither the cock nor his spouse possesses the power of singing, although they can utter a large variety of sounds, from the gentle cluck of contentment, the incessant talk by the mother to her children, and her triumphant announcement of the laying of an egg, to the cock's bold challenge to battle—the latter being as unique a sound among birds as is the bray of the donkey among beasts.

Poets have, with their usual inaccuracy, been accustomed to associate the crowing of the cock with the dawning of morn. The neighbours of persons who keep fowls know better. Unfortunately, the cock appears to be entirely unaware that it is possible to have too much even of a good thing, and is ready at all hours of the day or night to lift up

his voice in defiance of all or any within hearing, or to accept the most distant challenge borne



upon the air. This constitutes a grave defect upon the part of the cock. Among human beings we are accustomed to consider the constant braggart to be a coward. No such suspicion can attach to the cock; but it is a pity that he cannot be brought to understand that it is useless to be uttering defiances at all times, when the interposition of a strong wire netting renders combat impossible.

The cock can, however, be silenced. Just as the donkey cannot bray without straightening its tail, the cock cannot crow without standing perfectly erect. A light plank, or

even a lath, placed above his perch, so as to prevent him raising his head to the fullest, will effectually silence him. To the negro race the attractions of the domestic bird are simply irresistible, being shared, however, by those of the melon. In the United States it is found that even the most irreproachable conduct in every other respect, together with a close chapel membership, fail to brace him to resist their temptations, and that the fowl-house and melon patch are attractions irresistible to the negro. Indeed, a yielding to temptation in this respect is regarded by him as no more serious an offence than is the purloining of an umbrella or the cheating the Customs by an Englishman.

The domestic fowl, although itself affording delicate eating, is in no way particular about its own food, and is in this respect almost omnivorous. Insects, slugs, and worms are doubtless its natural food, but it delights in grain of all kinds, and will eat with avidity vegetable refuse and kitchen scraps of every description. Neither fish, flesh, nor fowl comes amiss to it, nor does it, as far as it is known, suffer from indigestion, although occasionally inconvenienced by over-eating. But as the greater part of humanity also suffer from partaking of a much larger quantity of food than is necessary for existence, it would be unfair to blame the fowl on this account. Upon the whole, the cock and his wife are, except for a tendency to be quarrelsome and an inordinate fondness for lifting up his voice on the part of the former, a couple deserving our highest admiration, alike for the courage and valour of the male, the domestic virtues of the female, and the assiduity which they display not only in the multiplication of their race, but in the provision of a large supply of most wholesome and nutritious food to man.

THE SPARROW.

IF, out of the whole feathered creation, one bird had to be selected as the national emblem, it is questionable whether, upon the whole, any could be found more suited to the position than the sparrow. He is a bold, daring bird ; where he settles he speedily makes himself master of the position, and elbows out all rivals. He can adapt himself to all climates ; he is prolific, and multiplies with appalling rapidity. He can make himself at home equally in town or country, and manages to thrive where other birds would die. He has, of course, some characteristics which Englishmen would perhaps repudiate, but it must be owned that the natives of every other country are almost unanimous in crediting us with their possession. He is quarrelsome, combative, self-sufficient, given to bullying the weak, and has an excellent opinion of himself. If a foreigner were asked to describe our national characteristics, some of these qualities would certainly be included in the list ; and it is a question if any bird possesses so large a share of our national characteristics as does the sparrow. He is distinguished for his partiality to the neighbourhood of human abodes. The swallow may build as frequently against houses, but he only uses them as a convenience,

and gathers his food or takes his pleasure entirely regardless of the inhabitants of the house against which he builds. The sparrow, on the contrary, would just as lief place his nest near a house as on it. He will build in a disused chimney, or a gutter, or rain-pipe ; but if none of these places suit his fancy, he will establish his nest in the ivy covered wall near at hand, or in a clump of bushes, and, having so built, he proceeds to get at once benefit and amusement from his human neighbours. He regards their fruit trees and rows of peas as planted for his special benefit. He sits on the edge of the roof and observes man as he walks in his garden with evident interest and amusement, and discusses his peculiarities loudly and volubly with a friend on an adjoining roof. He is quite fearless of man's presence, and will pursue his search for insects on the lawn within a few feet of him ; and he relies confidently upon receiving offerings of food in hard, frosty weather in return for his friendship. He alone, of birds, makes himself thoroughly at home in the crowded streets, perfectly fearless of passing vehicles. He is gregarious by habit, and it is to be remarked that there is nothing selfish about him. Throw out a handful of crumbs upon the snow, and its first discoverer will joyously call his mates to share in it ; and if fights do occasionally arise over the division, it is apparent that there is no malice about them, but that, like the Irish, the sparrow fights from high spirits and "a love of divarshun."

While the sparrow is favourably viewed by the dwellers of towns and their suburbs, it must be owned that he is not regarded in the same light in the agricultural districts. He is eminently a Socialist, and inclines to the doctrine of equal rights. When he is comparatively few in

numbers man does not grudge him the small share he claims, but when his numbers are legion it becomes another matter. The farmer regards his stacks and his crops as his private property, and when myriads of sparrows demand toll the agriculturist is apt to become rusty. He sees the sparrow only on his predaceous side, and has no leisure to investigate his amiable qualities. The few insects the sparrow may destroy in his leisure moments weigh but little in the farmer's mind as against the loss of his crops of cherries, the general destruction of his peas, or a wholesale raid upon his corn stacks, and so he betakes himself to net and gun. This would seem hard upon the sparrow; but he has no right to take it amiss, for it is his own habit to wage a war of extermination against other birds wherever he obtains a footing. The native birds of North America are rapidly disappearing before the army of sparrows that have sprung from the few hundreds sent out to cope with the caterpillar which devastated the trees in the parks and open spaces in New York—just as the aborigines of the country have been almost wiped out by the Anglo-Saxon settlers. Even in this country he is fast driving out other and more useful birds; the tits and the finches abandon neighbourhoods where he abounds, and the house martin has almost disappeared from some localities. The consequences of this tyrannical conduct will, in the long run, recoil upon the sparrow himself. With the decrease of the insect-feeding birds, the pests of our fields and gardens will so multiply that, in self-defence, a crusade against the sparrow will be organised in all rural districts. The movement has, indeed, already begun in many localities, and in the future we may expect the sparrow to leave the country

side, where he is neither liked nor appreciated, and to establish himself altogether in towns, where his sprightliness and fearlessness render him a favourite.

It may be admitted that his voice is not the strong point of the sparrow, but perhaps it is as well that this should be the case, for were he vocal the volume of sound would be unbearable in neighbourhoods where he abounds. There is, however, a cheeriness and good-fellowship about his confident and inquisitive little chirp, and occasionally in the days of his courtship he can emit a very cheerful little song. Although so domestic in his habits, the sparrow takes but little trouble with his nest. It is a ragged collection of odds and ends, and is evidently built on the assumption that his offspring will, like himself, have to be handy and shift for themselves, and that anything like luxury would be thrown away upon them. As a conversationalist the sparrow excels. His short notes are very numerous and varied, he is fond of learning the opinions of his neighbours, and of laying down the law himself. Animated discussions, warming sometimes into quarrels, arise frequently from these consultations upon the housetop; but they seldom last long. There is a rush into a bush and a hot pursuit, sharp angry cries, and a momentary tussle; and then, the matter having been arranged, the disputants separate amicably and proceed on their various business.

The flight of the sparrow is not elegant; he wastes no time in graceful curves and turnings, but hurls himself straight at his mark. He has none of the restlessness of the migrants; he has hard times here when the ground is frozen and food is scarce, but he takes the rough with the smooth, and has no thought of seeking warmer climes.

Contenting himself with the shelter of a bush, he fluffs out his feathers, and reduces himself into the smallest compass, so that he is almost unrecognisable as the alert little bird with long neck and sprightly movements that we know in the summer. His confidence in the goodwill of man in the time of his distress is touching. Blackbirds, starlings, and thrushes will come to share the feast man throws out ; but they never lose their fear of him, and are ready to take flight at the first sign of his presence. The sparrow and the robin will alone hold their ground, will light on the window sill fearlessly, and will, if encouraged, even come into the room through the open window ; and the man must be hard of heart indeed who will refuse to give them the little they need to save them from perishing. Fortunately for the sparrow, his flesh is not particularly toothsome, and there is but little of it. Were it otherwise, it is to be feared that he would not be spared ; but that as Goths are found capable of devouring that charming songster, the lark, still less respect would be shown to the friendly sparrow.

Doubtless, the bird would be a less imposing national emblem than the eagle, especially when the latter is adorned with two or three heads ; but he would be at least as respectable a one. A cock sparrow rampant would be a not unfitting emblem of the push, the energy, the hardiness, the pluck, and the domesticity of the Englishman ; and even its self-sufficiency and its cockiness should not be taken amiss by a nation who are, by the general consent of mankind, the most arrogant and self-sufficient people upon earth. Should anything happen to put us out of conceit with the lion, we cannot do better than instal the sparrow in his place upon the national arms.

FLIES.

ENGLISH poets, whenever they have condescended to take notice of the domestic fly, have done so from a favourable point of view. It is for them the sportive fly, the jocund fly, or, at worst, the giddy fly. This in itself will be a sufficient proof to future generations that the poets of our day did not suffer from the loss of their hair, for no bald-headed man would view the foibles of the fly indulgently. It must, therefore, be assumed as proved that the mental exercise of the elaboration of poetry causes a certain cerebral warmth which conduces to the growth of the hair ; and this view of the case will receive an additional support should any portraits of Lord Tennyson be extant at the time when this investigation takes place. It is singular that, whereas bald-headed men have a marked and unanimous objection to flies, the latter have on their part a warm and effusive affection for bald-headed men. No philosopher has, so far as we know, attempted to explain the irresistible attraction which a bald head presents to a fly. It has been suggested, indeed, that, owing to its high polish and its capacity for reflecting light, it is assumed to be a luminous globe, and so exercises the same attraction to the fly as the globe of a gas light does to the nocturnal moth. A far more probable solution is that, as we know,

the feet of flies are provided with suckers, and that as but few surfaces are sufficiently smooth for the perfect working of these machines, they view a bald head as a delightful place of exercise for them, and enjoy the fun exactly as the street boy enjoys the similar sport of attaching a leather sucker to the pavement and pulling at it with a string. The fact that poets view the vagaries of the fly with a mild indulgence will also, by our far-off descendants, be taken as a proof that the poets of the eighteenth and nineteenth centuries were well-paid and well-to-do persons, living in cool and shaded abodes; for undoubtedly, although the wealthy man who dwells in houses of this kind may view the fly with gentle tolerance, and even with amusement, such is not the light in which it is regarded in the dwellings of the poor. Indeed, it may be said that, with the exceptions named, the fly is invariably regarded as an unmitigated nuisance, rising in many countries to the dignity of a scourge.

In small numbers—in very small numbers—it may be admitted that the fly is, as Artemus Ward would have said, an “amoosing little cuss.” His restless, and apparently purposeless, circling and dancing in the air, the way in which he is perpetually charging any other of his species who flies near him, the earnestness and perseverance with which he brushes his many-lensed eyes with his forelegs, and arranges his wings, the gravity with which he inspects and tastes the sugar and other articles on the table, the confidence with which he treats all that is yours as his, and the pertinacity with which he insists on committing suicide in the milk jug—all these traits are amusing when you do not get too much of them.

The *raison d'être* of the fly has not yet been discovered. Naturalists tell us that he belongs to the order of *Diptera*—that is, that he has but two wings—but they cannot tell us much more about him. The common house fly is provided only with a proboscis, somewhat resembling that of the elephant, with which he takes up moisture; but he has a cousin exactly resembling him, who when, relying upon this likeness, you allow him to settle on the back of the hand, neck, or other surface of flesh, instantly digs in a sharp lancet, which is capable of drawing blood. Happily, however, this treacherous cousin is comparatively rare, and none of the poets appear to have been familiar with him. But if in England it is still doubtful why the fly was created, there is no hesitation on that point in foreign countries. There the consensus of opinion is unanimous. The fly was made to try the patience of man. He was intended to make human life a burden by his buzzing, his settling, and his tickling, by the zeal he shows in rendering food uneatable, and by the cunning with which he circumvents all the efforts of man to interfere with his designs.

No one, indeed, can watch a fly engaged in the work of human torment without entertaining a suspicion that he is possessed of a certain diabolical instinct. So long as the man is wide awake, the fly will keep at a distance, unless, indeed, he sees that he is engaged in writing, and that his hands are ineffective for offensive purposes. The instant, however, that drowsiness steals over the subject, the fly, who has pretended to be taking no notice whatever of him, but to be engaged in a game of touch-as-touch-can with two or three of his comrades in the air, at once gives up his romps and takes to business. Choosing the most sensitive

point he can find, he alights upon it, and begins to shuffle his feet about. A score of times he repeats this performance, generally selecting a fresh spot each time, and always evading any slaps aimed at him. It is remarkable that while at other times he flies noiselessly, he begins to buzz when he commences this game, so that even when he does not settle, he causes watchfulness and drives away sleep.

The fly who establishes himself in the kitchen enjoys higher delights than the flies who occupy other portions of the house. Cooks are notoriously an irritable genus, and the more irritable a victim, the more a fly enjoys tormenting him or her. Besides, cooks often have their hands full, and so are unable to defend themselves, and a fly always in preference attacks a person under these conditions. It is an admitted fact that flies possess a strong *esprit de corps*, and that they resent any interference with their ways. In a house where flies are undisturbed, they take good care not to be troublesome beyond a certain point. But if war is waged upon them, they are implacable. The foolish man who tries fly paper, whether of the sticky or poisonous sort, will soon regret having done so, for legions of flies assemble to revenge their slaughtered comrades. For every one slain a hundred put in their appearance, and madness is the probable result of perseverance in the crusade against them. The Egyptian woman is well aware of this, and will allow a hundred flies to settle undisturbed around her infant's eyes, knowing that if she brushes them away worse will befall.

As autumn draws to its close, the fly changes his habits. He ceases to gambol in the air, for although his attacks upon human beings become more persistent and annoying

than before, the quickness and the cunning are gone, and an obstinate, blundering stupidity has taken their place, and the fly in turn becomes the victim. If he escape this fate, upon finding death at hand he selects some spot where his demise will be particularly objectionable to the careful mistress of the house: a window, a looking-glass, a burnished ornament, or even a particularly white piece of wall-paper is chosen, and there he dies, a white fungus growing out of his body, and spreading to some distance around the spot where he has breathed his last. Whether this white fungus is the cause of his death, or whether his death is the cause of the white fungus, is still a point of dispute among the learned; the rest of mankind are contented to know that he is dead.

Unhappily, a certain proportion live over the winter, taking refuge in warm nooks and corners, and hibernating there. So seldom are they found, however, that it is a belief among the unlearned that the fly, like the swallow, is a migratory creature, and that upon the approach of cold weather he seeks warmer climes. It is urged, with a strong show of reason, how can all the vast number of flies destined to be the parents of the countless myriads in the following year hide away so as to escape detection? Scientific men have never attempted to grapple with the problem, but cover their ignorance by saying that as they are sure flies do not migrate, and as flies do reappear in the spring, it is self-evident they must hide away somewhere; and with this dictum the public must be content. Taken all in all, it must be admitted that the fly has a good time of it, and that his life is devoted solely to amusement, varied by feeding. Most other creatures labour hard for a not

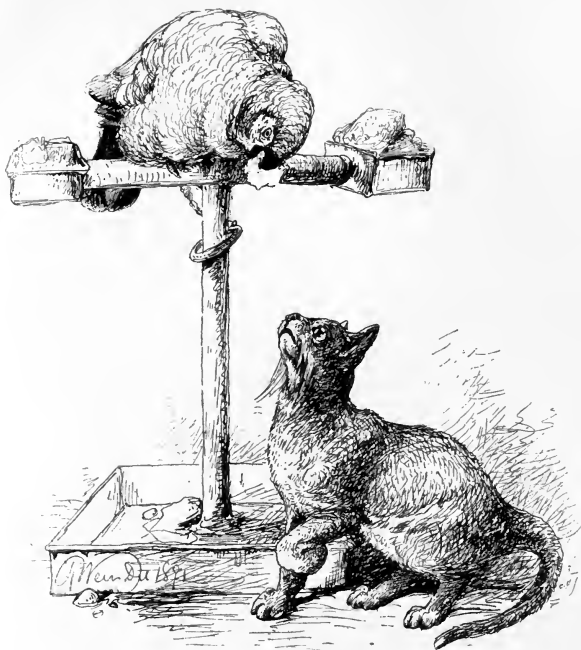
inconsiderable portion of their life in the preparation for and care of their young. The fly neither builds nests like the birds, nor lays up stores of food like the bees and wasps, nor pierces holes in wood like the beetles, nor spends half his time in the hunt for food like most quadrupeds. He assumes no responsibilities, for he has neither home nor family. Man places his food on tables for him, and builds mansions in which he can sport, untroubled by the weather. As the fly is found in every part of the known world, it must be assumed that he really has his uses, and that he possesses some latent virtue, edible or medicinal, which a future generation will, it may be hoped, discover and turn to account.

THE PARROT.

THE parrot is at once wise and amusing—a conjunction seldom observed in the human race. Under the general denomination of parrots are included several distinct species, varying from the great macaw to the tiny paroquet, having an exceeding wide range of distribution, being found in South America, Africa, and India, and the group of islands stretching down to Australia. Brilliant colouring is the most striking characteristic of the family, although there are some members, especially the parrot of Western Africa, that are almost Quaker-like in the quiet grey of their plumage. Next, perhaps, to their colour, their most notable characteristic is the extreme harshness of their voices, which are at once shriller, more discordant, and more agonising to the human ear than the sound uttered by any other of the animal creation, being approached only by the feminine voice when raised in anger. It is the more surprising that this should be so, since, as is evidenced by his nice powers of imitation, the parrot is endowed with a delicate ear, and there can be little doubt that the quality of his own voice, and of the voices of his wife, his family, and neighbours, must be a serious drawback to his happiness. Many parrots are gregarious in their habits, and the noise

made by one of these flocks is prodigious. The shrill screams, the angry scoldings, and hoarse ejaculations create a din not altogether dissimilar to that which must have arisen from a city in ancient times when being sacked by a victorious soldiery. Among the smaller species, such as paroquets, every movement is marked by grace and agility. They are restless and playful, and very affectionate in their intercourse with each other. Attachment between husband and wife is very tender and lasting, and the death of one is generally followed speedily by that of its mate. We have less opportunity of observing the domestic relations of the larger parrots—the macaws and cockatoos—for few men are hardy enough to support the noise of more than one of these birds, and a scolding match between a cockatoo and his wife would be sufficiently discordant to empty even the largest house of all other inmates. It is singular that the tongue of this, the noisiest of birds, resembles more closely that of man than does the tongue of any other bird, being singularly thick and fleshy; it is doubtless due to this peculiarity that it is able to imitate the tones of the human voice so accurately as to defy discrimination.

While cheerfulness, sociability, and activity characterise the smaller parrots, the larger birds are marked by the striking variation of their moods. At times they will exhibit for hours an extreme restlessness, climbing up and down their perches, hanging head downwards, and indulging in a variety of strange antics. At others they will sit for long periods almost immovable, being distinguishable only from stuffed birds by the occasional droop over the eyeball of their white filmy eyelids. The mental characteristics of the larger parrots can hardly be termed agreeable, being marked



"INDULGING IN A VARIETY OF STRANGE ANTICS."

by cynicism, malice, and a consciousness of superior wisdom. We do not say the assumption of superior wisdom, because no one can doubt its existence ; and one of the problems which the human mind has failed to solve is what there is that the parrot doesn't know. Diogenes in his tub could hardly have been wiser or more cynical than an elderly cockatoo ; and a human being, when watching one of these birds, feels the same consciousness of youth and inexperience that David Copperfield always suffered from in the presence of the irreproachable Littimer, and that the traveller in Egypt experiences when gazing at the Sphinx. One cannot but feel that the parrot has, in addition to his inborn stock of wisdom, acquired a deep knowledge of human nature, as the result of years of careful study ; that he has weighed man in the balance, and has come to the conclusion that he is altogether wanting. There is, too, the unpleasant feeling that the parrot has studied almost exclusively the worst side of human nature. The leer of his half-closed eye, the mocking laugh, the expression of malice in his tones, the hypocritical demeanour of friendliness until a finger approaches near enough to be seized—all this testifies sadly to the fact that the parrot has assimilated the worst qualities of man, while there is no sign that the better ones have made the slightest impression upon him. Of benevolence there is no trace, and, although capable of affection towards his mistress, he treats all other persons with equal nonchalance and contempt, although he may be cajoled into temporary familiarity by the offer of favourite food. The deep emphasis with which he mutters "Poor Polly," shows the intense self-pity with which he views his forced habitation among such trivial and contemptible companions, and his regret at his own moral

degeneration, the result of association with them. He knows that under happier circumstances he might have grown a respected patriarch in his native wilds, honoured, by those able to appreciate him, for his wisdom, and surrounded by respectful and admiring descendants, and it is the contrast between this and his present lot that has soured the bird's temper and made him a cynic and a misanthrope.

Hardly less prominent a characteristic among parrots than cynicism is malice. The parrot delights openly and undisguisedly in giving annoyance. To seize the tail of a passing cat, or to awaken a sleeping dog with a sharp bite, affords him a delight over which he will laugh for hours. It is a pleasure to him to interrupt a quiet conversation with wild and sudden screams, and if by imitating a tradesman's cry he can give a servant the trouble of going to the door, his malicious pleasure is unbounded.

The upper mandible of the beak of the parrot bears the same relation to that of other birds, as does the nose of the elephant to the similar feature among quadrupeds. Instead of being fixed to the skull, it is furnished with a separate bone, and is attached by a sort of natural hinge to it. He is thus able to open his mouth to a very wide extent, and to grasp a finger, a nut, or any other object with amazing force. In bestowing this faculty upon the parrot, Nature had an eye solely to the creature's own benefit, and entirely disregarded the possible consequences to man. The foot, too, has an exceptional formation, giving the bird great power of grasp, enabling it at once to climb, to hang head downwards, or to hold its food while it devours it, with a power and facility almost unequalled among birds. It is not surprising that, with its power of imitating the human

voice, and of modulating the natural harshness of its accents to the softest tones of that of a woman, with its human-like manner of taking its food, its close attention to everything that passes around it, and its evident wisdom, the parrot has from the oldest times been regarded with a certain superstitious respect by man. *Ælian* states that in India these birds were the favourite inmates of the palaces of the princes, and were regarded as objects of sacred reverence by the people. Among civilised nations this feeling has to some extent died out, but even now servant maids generally regard their mistresses' parrots with dislike and aversion, being never quite sure that the parrot will not act the part of a tell-tale, and mention to its mistress that a shattered ornament was not really, as supposed, the work of the cat. The aversion is almost always mutual, a parrot very seldom admitting the slightest approach of familiarity on the part of a domestic, regarding her with the aversion which the dog manifests towards the tramp. Throughout the East the parrot has always been regarded as a bird possessed of mysterious knowledge and power, and frequently bears a prominent part in Arab legends. As a proof of the ingrained wickedness of the parrot's nature, it need only be pointed out that it possesses a remarkable facility in acquiring bad language, and will pick up sailors' oaths far more readily than it will acquire polite language. Upon the whole, although endowed with remarkable physical advantages, it must regretfully be owned that the parrot is a striking example of misapplied talent.

THE COCKROACH.

THE cockroach, the black-beetle of the London kitchen, is a creature that excites an amount of repulsion that cannot be accounted for or explained. There is nothing threatening in its appearance, as in that of some of the larvæ, notably the one popularly known as the "devil's coach-horse." It is unprovided with offensive weapons at either extremity; it can neither sting nor bite. It has not the habit of startling nervous persons by leaping suddenly upon them, as do the cricket and grasshopper. There is nothing about its figure that should be displeasing to the eye. It is, as far as man is concerned, absolutely harmless, and yet it certainly excites in the majority of persons a feeling of aversion approaching abhorrence, such as no other insect gives rise to. The cold light of reason fails to discover any ground for such a feeling, and it has been gravely adduced by some as a proof of the truth of the belief in the transmigration of souls; and that only upon the assumption that the souls of evil men are condemned to pass a portion of their future existence in the form of cockroaches, can the general antipathy to these creatures be accounted for.

There are many unsolved problems connected with the cockroach. Where does he come from, and especially

where did he abide before man began to build houses? In this country, at any rate, he always takes up his abode in the habitation man provides for him: No one ever came across him in the fields or woods. It is in the house he lives and multiplies. He fears man and shuns his society, and yet appears to have a mysterious attraction to his abodes; the cricket only among insects, and the mouse and the rat among quadrupeds, share with the cockroach his partiality for human dwellings. But the cricket is but a domesticated grasshopper, the mouse has a country cousin, and the rat will take up his abode in many other localities. The cockroach alone is never found elsewhere, and has no relations in any way closely connected with him who are dwellers in the open air.

Next to man's houses, the *blatta*, as he is scientifically called, loves his ships; but the variety that is found in vessels, especially in those trading with the East, is a larger, uglier, and in every way more repulsive creature than his English cousin. Once on board—and there is scarce a ship afloat into which he has not smuggled himself—he is there to stay, and short of sinking the vessel, or of fastening down the hatches and suffocating him with the fumes of sulphur, there is no way of getting rid of him. He multiplies with extraordinary rapidity, and his odour, when he is present in multitude, is so strong that in the hold many ships trading in hot countries it is almost overpowering. The flatness of his body enables him to crawl through every chink and crevice, and all efforts to keep him out of the cabins are unavailing. The ship variety has none of that fear of man that sends the kitchen cockroaches scuttling in every direction at the approach of a maid with a

light. They will fearlessly perambulate his cabin, take up their posts on the deck-beams over his head, will watch him gravely with waving antennæ, and the moment they discover that he is asleep will run over his head and face, entangle themselves in his beard and hair, and gently nibble the skin on the tips of his fingers and toes.

The cockroach is an admirable judge of the weather. On board a ship the approach of a rain squall will bring them up from the hold into the cabins in tens of thousands; and in vessels where they abound they will blacken the ceiling, drop on to the tables, and drive nervous passengers for refuge to the deck. Whether the British variety is equally affected by the weather is a point at present undetermined, for as he does not emerge from his hiding places until the servants have gone upstairs and the lights are out, his habits have never been examined very closely.

The eccentricity in the movements of the cockroach has doubtless had a share in producing the feeling with which he is regarded. His ordinary pace is a fast though stealthy walk, but he is given to sudden pauses, remaining immovable, save for the constant waving of his long antennæ, which show that he is deep in the meditation of past sins or future wickedness. But when alarmed his speed is extraordinary: he is gone in an instant like a flash, and it needs no ordinary quickness of eye and action to bring the avenging foot down upon him. Even in his death he acts upon the human nerves, exploding with a sharp crack of so singularly thrilling a description that many even of those who most greatly dislike the cockroach cannot bring themselves to slay it.

It is on this account principally that nothing like an

organised war is waged against the cockroach. Feeble efforts are made now and then to get rid of it by scattering beetle paste, and other supposed destroyers, about the kitchen, or by setting traps for it to walk into; but these measures, although effective to a certain point, make but small inroads upon its numbers, and it is only when it ascends the stairs and begins to pervade the house that serious attention is paid to it. There are men in London who make a livelihood by clearing houses, restaurants, and other dwellings, of cockroaches. Their methods are a secret, but they are certainly efficacious, and did the operators advertise their addresses they would be very largely patronised. Some have supposed that they charm the insects from their hiding-places by the sounds of sweet music; others that they possess a perfume which the cockroach cannot withstand, and that by it he is attracted to his death; while a few hold the belief that the insects are induced to leave their abodes by the use of cabalistic words.

The cockroach, like most of the order of orthoptera to which it belongs, retains the same form from the date it issues from the egg to its death. Familiar instances of this peculiarity are the earwig, locust, and grasshopper. The only difference between the first and second stage is that they do not become winged until arriving at maturity, the wings being then folded up under the leathery reticulated wing-case that distinguishes the order. It is rarely, indeed, that the cockroach uses the means of locomotion with which nature has provided it. It is possible that if it took to out-door exercise it would do so; but, passing its life as it does indoors, it has no occasion whatever for the use of its wings, and many people are even unaware that it

is provided with them. The cockroach is not particular as to its food, and will devour almost anything that comes in its way. Crumbs of bread, fragments of fat or meat, sweets of all kinds, and indeed almost all food consumed by man, are welcome to it. It has a marked partiality for boot blacking, and is even able to digest leather. It will drink water, but its tendency is rather towards liquids of a sweet or intoxicating nature. Treacle or sugar in water attracts it, but it has a marked preference for beer, and traps for its ensnarement are generally baited with this liquor.

Unlike the cricket and the grasshopper, the cockroach is mute, at least so far as our ears are able to perceive, although it is certain that it can carry on long conversations with its own species, and two of them may often be seen standing head to head in close confabulation, enforcing their arguments with waves and flourishes of their antennæ. Entomologists may assign the *blatta* a specific place among the orders and genera of insects in accordance with their characteristics, but morally they stand apart. They are the rats of the insect world, swarming out in their armies from dark recesses in search of garbage ; no one, indeed, can doubt that, had they the power, they would not hesitate to follow the example of the rats on the Rhine, and to devour a bishop if he fell in their way. Other insects stand apart from them. The cricket may dwell in their midst, but he is not of them, while no observer has remarked a single case of friendship between the industrious bee, the impetuous and hard-working wasp, or, indeed, any other of what may be called respectable insects, with the cockroach—a strong proof that the creature is viewed with the same marked disfavour by the insect world that it excites in the breast of man.

MICE.

SINCE men and mice first became acquainted with each other, the mouse has been an enigma to the man. That it possesses strange and mysterious powers he is fully aware, although himself unaffected by them; and to this day neither naturalists nor philosophers have been able to account for, or explain, the abject terror with which the mouse is capable of inspiring the female mind. To the male eye, the mouse is one of the most harmless and inoffensive of created things. With its soft coat and its bright eye, there are few prettier little creatures. It is very easily tamed and domesticated; and most boys have, at some time or other, kept mice as pets. It is affectionate, intelligent, and capable of acquiring all sorts of tricks. It is afraid of man, but it rapidly acquires confidence in him, and after a very few visits it will, if undisturbed, fearlessly pick up crumbs close to the foot of any man who will sit still and watch it. Mice at play are as pretty as kittens, without any of the spitefulness which readily shows itself in even the youngest of the cat tribe. Were the mouse unknown in England, a few imported here would soon, it might be thought, be regarded as the most charming little pets ever introduced.

Such is the mouse as it appears to man. It is true that he is obliged to wage war with it, for it is so prolific that if man and its other enemies did not keep down its numbers it would, in a very short time, produce a famine in the land. It has most destructive habits of burrowing in



walls, and eating holes in flooring and wainscots ; while its depredations in stacks, granaries, and other similar places are serious. Thus man is forced in self-defence to war against mice ; but he does it without ill-feeling, and would rather be able to leave the pretty little things alone. The last thing that would enter his mind would be to be afraid of them, and the terror with which they inspire women is

to him absolutely unaccountable. In many respects women are to the full as brave and courageous as men. In the horrors of a shipwreck, in the dangers of a siege, in times of great peril, such as the Indian Mutiny, women have, over and over again, showed themselves to be at least equal to men in bravery, in calmness, and in endurance. But the woman who would, pale but firm, face a lion in an arena, will fly in terror from a mouse; and many a moment of sweet revenge and triumph has been felt by men with spouses of strong minds and shrewish tongues, when they have seen them paralysed with terror by a tiny mouse.

History records no example of a mouse attacking a man, and, when tamed, they never use their teeth. They have no powers of scratching; they cannot assume a threatening aspect; they neither show their teeth, growl, nor spit; they cannot stick up their furs as can a cat; they are, in fact, absolutely without means of aggression, and yet women quail before them. Man has wearied himself with conjectures as to this phenomenon. The Greek and Roman philosophers were posed by it, and the saying, *parturiunt montes, nascitur ridiculus mus*, which has ignorantly been supposed to signify that a small matter was produced after great labour, has, when critically examined, an entirely different and far more profound meaning. The philosopher clearly desired to signify that it needed the labour of mountains to produce a creature capable of awing the female mind. In the Greek fable of the Lion and the Mouse, the same feeling of respect and appreciation for the smaller animal is clearly shown. Some have gone so far as to trace back the enmity between the female and the mouse to the earliest times, and the argument has been advanced that the word trans-

lated as serpent, in the account of the Fall of Man, really signified mouse, an explanation which alone seems to satisfy the exigencies of the case.

This hypothesis is greatly strengthened by the fact that the mouse does go on its belly; alone among quadrupeds its feet cannot be seen to move, and it apparently glides along on its stomach. Then, again, its head, and, indeed, its whole body, is very frequently bruised, and, in fact, crushed by the human heel, and for every serpent upon which this process is performed it is done a hundred thousand times upon mice. The mouse does not, it is true, in return bruise the heel of its bruiser; but neither does the serpent, so that this objection applies equally in both cases—indeed, a tight shoe is the only article which habitually bruises or raises blisters upon the human heel. This is no novel idea, for in some old paintings the tempter is pictured in the form of a mouse sitting on Eve's shoulder, and whispering in her ear. That the Jews entertained a feeling of abhorrence for the mouse far above anything that can be accounted for by natural causes, is proved by the fact that Isaiah lxvi. 17 says, "Eating the abomination, and the mouse." These facts, coupled with the abject terror inspired by the mouse in the female mind, are really worthy of the attention of divines, who cannot fail to notice that whereas the creature, translated serpent, is said to be more subtle than any other beast of the field, the word cunning, which is synonymous with subtle, is still essentially applied to the mouse; while—putting aside the fact that the snake is not a beast at all—no modern investigator has ever claimed any particular amount of cunning for the serpent.

The terror with which women regard the mouse finds

expression in various unlooked-for ways. Man has no peculiar liking for his nether integuments, as is evidenced by the eagerness with which cockney sportsmen, who go North, don the Highland garb instead of trousers, and by the popularity among the young fellows who constitute the Scottish Volunteers, of the ordinance which transformed the whole regiment into a "kilted" corps. Among women, however, movements are constantly taking place for the adoption of male lower garments. Sometimes these are spoken of as bloomers, sometimes as knickerbockers, sometimes as divided skirts. The advocates of these garments base their arguments on the ground of health and convenience; but men, who go beneath the surface, are well aware that these are but pretexts, and that the real reason why women desire masculine garb is that they may the better protect their lower limbs from the onslaught of the marauding mouse. No one who has ever seen a woman stand on a chair and wrap her garments tightly round her ankles upon the alarm of "mouse," can question how keen is the consciousness among the sex of the possibilities of attack by their formidable opponents offered by the present style of clothing. It cannot be pretended that it is the mere fear of being bitten which so unhinges the female nerves where mice are concerned, for there are women who make parrots their pets, although parrots sometimes bite atrociously, and are singularly treacherous withal. There are others who pet spiteful cats, and snappish lap-dogs, and whom neither scratches nor occasional bites at all discompose. It cannot, therefore, be argued that any fear of pain is at the bottom of their antipathy for mice. The mere fact that here and there women can be found who profess not to be afraid of

mice in no way affects the general truth of the argument. There are women who are not afraid of cows ; who will not jump up in an open boat if it rocks ; who are not fond of babies ; who do not care for kissing their female friends in public. There are even women who will dress as they please, and not as their dressmakers tell them. But these are the exceptions which prove rules, and the almost universal fear of mice by women can be accounted for only upon the hypothesis of which we have above made mention.

CATS.

THE cat is generally considered to be a domesticated animal, but it would be more justly described as a gregarious one. No one who sees the placid and indifferent air with which the cat conducts itself when within doors, and compares it with the wild rapture with which the creature lifts up its voice when assembled with five or six of its species upon the end of a garden wall, can question for an instant that the cat is above all things gregarious in its instincts. That domestication is alien to the feline nature is proved also by the fact that there are no recorded instances of lions, tigers, or even the wild cats of these islands, walking into a parlour and lying down upon the hearthrug of their own accord. In the case of the wild cat it may be urged that such an advance on its part would not be welcome, but assuredly no opposition would be offered to the lion or tiger who might yearn to domesticate itself in this manner. The extreme repugnance which the feline race in their wild state evince for fire is another proof of the absence of any domestic yearnings in their breasts, for fire is the emblem of domesticity. The cat, then, has clearly assumed domesticated habits under protest, and as against its innermost nature; but it must be admitted

that the imputation of hypocrisy, which has been freely brought against the animal, is hardly justified. The cat, to do it justice, pretends to no fondness whatever for those who care for it. It will submit to be rubbed and stroked, and to be placed upon ladies' laps, simply because it likes these attentions, not because it is grateful to those who render them. It will rub against a human leg, but will also rub against the leg of a table with an equal air of affection. It will not answer when called unless there be a prospect of food, but will gaze in stolid indifference at the fire, as if wholly unconscious of being addressed. This absence of affection in cats is in itself an argument against the Darwinian theory. Since the days of ancient Egypt, cats have been pets. Ladies have—in the absence of better subjects for affection—doted upon them from time immemorial ; but in all these countless generations the cats have not been able to get up a reciprocal feeling. Friends of the species have endeavoured to urge in its favour that it is affectionate to its young. If, however, five out of six kittens are removed and drowned, the mother in no way concerns or troubles herself. She certainly will look sharp after the last, but this only shows that she likes to have something to nurse and play with. Had she had a particle of real love for her offspring, she would have cared for all alike.

An intense devotion to public assemblies of its kind upon housetops and walls, and to the raising of music, Wagnerian in its absence of melody, are the special characteristics of the cat. To gratify its passion for concerted music it will dare every danger. Showers of lumps of coal, of boots and brushes, cause but a momentary interruption of its song ;

and even wet weather, which of all things it most hates, will not suffice to damp its ardour. It can hardly be doubted that cats are well aware that their gatherings for vocal purposes are hateful to mankind ; but this knowledge in no way affects them, and even the voice of the mistress, who an hour before bestowed bread and milk, is absolutely unheeded when raised in an agonised appeal for silence. The predatory instinct is strong in these creatures, and however well a cat be fed or treated, it remains a thief to the end of its life. It is believed by those best acquainted with them that the greater portion of the time spent by a cat sitting in a state of apparent somnolency on the hearthrug, is really occupied in maturing plans for the surreptitious carrying off of pats of butter, for raids upon the larder, or for the assassination of canary birds.

The question why the cat should of all creatures be selected by ladies as a domestic pet has occasioned high debate among philosophers of all ages. The animal possesses many vices. It is erratic in its habits, noisy, and thievish. It has no real affection for its mistress. It has but one virtue—it is soft, but many other things are soft which are free from drawbacks. Some have pretended to see a resemblance between the natures of the cat and the woman, but no sufficiently strong analogy can be traced to support so libellous an assertion. The fact that both love the fireside and hate going out into the wet, and that it is dangerous to rub either the wrong way, can scarcely be considered as of sufficient importance to warrant the suggestion of general similarity. The feeble plea that cats catch mice cannot be admitted as an argument in favour of their general acceptance. There are not mice to catch in a great many houses,



A GATHERING FOR MUSICAL PURPOSES.

and it is notorious that where there are, not one cat in fifty will trouble itself to catch them. The cat who can get milk given it in a saucer is not going to trouble itself by catching mice ; and the knowledge that it is expected to pay for its board by keeping down mice troubles it not at all. Even as a mouse-catcher the cat is a poor creature—taking half an hour over a job which a terrier of the same size will perform in a second.

It has been urged that without cats there could be no cat shows, and this may be conceded frankly, but mankind might get on without these exhibitions. Were cats unobjectionable in their ways, the onus of proving why they should be abolished would rest with those who do not keep them ; but as they are most objectionable, owing to the torture of nerves caused by their midnight assemblages, to say nothing of their destructiveness to well-kept gardens, it is for those who own them to prove that there is some compensation, some good quality, some advantage arising from the keeping of pets which are a pest and an annoyance to neighbours. A man is not allowed to hire an organ or a German band to play in front of his house, even in the day time, if a neighbour object ; why, then, should he be allowed to keep a creature which renders night hideous with its caterwaulings ? The legislation which taxes man's faithful friend and companion, the dog, allows his wife to keep two or three cats, and to populate the whole of the district with their progeny, if she choose to do so. Over and over again has the desirability of placing a tax upon these animals been pressed upon successive Chancellors of the Exchequer, but they have hitherto turned deaf ears to the suggestion ; and the reason is clear : Chancellors of the Exchequer are but

mortal, and have wives. No man having a wife would venture to propose a tax upon cats, and until we have a minister who is without either a wife or other female relations, sisters, aunts, or cousins, the cat will remain master of the situation.

And yet we are not altogether without hope. The present is essentially an age of association. There are Salvation Armies, Blue Ribbon Armies, Good Templars, Vegetarians, and Anti-tobacconists. Every one is interested in the well-doing of every one else. It cannot be doubted that sooner or later there will be an Association for the Suppression of Bad Language, and the very first step which such a body must take would be the suppression of the cat nuisance. It is calculated that at least 90 per cent. of those who have fallen into the lamentable habit of using strong expressions have been driven thereto, in the first place, by the voice of the midnight cat ; and a pious divine has gone so far as to admit that at least mental profanity is absolutely universal, even among the best of men, under these circumstances. Even ladies of irreproachable morals and conduct have admitted the use of mental bad language, under the irritation caused by hours of sleeplessness through the infliction of a concert on the tiles. A society which would take the matter in hand would command an enormous support, although the great proportion of the subscriptions and donations in furtherance of its object would be anonymous, for few men would venture upon an open adherence to a society which, as a first step towards the suppression of swearing, would undertake to put down the domestic cat.

THE LADYBIRD.

THE ladybird occupies among insects a position very similar to that held by the robin among birds, and is similarly protected by a feeling akin to superstition. It must be owned that the robin has no peculiar claims upon the affection of man, on the grounds of benefits bestowed. It sings prettily, but there are many birds which surpass it in this respect ; it has a friendly confidence in man, but not more so than has the sparrow ; it can scarcely be considered to hold very high rank among the birds that render man vital services by acting as exterminators of the pests of the fields and gardens, and, indeed, it takes an ample toll of seed and fruit for any service it may do in the way of destroying insects. The jay's bright feathers do not afford it protection from the keeper's gun, and the patch of red on the breast of the robin would scarcely in itself account for the general feeling in its favour. Nor would the pretty markings on the back of the ladybird, for there are many more brilliant and showy insects ; and the affection and kindly treatment which it receives, even from children, can hardly be explained, save as an instinct implanted by nature in the human breast, as a protection for one of his greatest friends and allies. Next, perhaps, to the ichneumon, the ladybird

is the most valuable of all insects to man. The bee furnishes him with wax and honey, the silkworm with a fabric for the adornment of his female kind, the cochineal insect with a dye, the locust with a food, this being, however, but a poor return for its destruction of vegetation. The worm acts as a subsoil plough, takes down dead leaves and herbage, and brings fresh soil to the surface ; many beetles work as scavengers, the Spanish fly provides us with blisters, and, indeed, it may be accepted that the great majority of insects are, in one way or another, directly or indirectly of benefit to man. But it may be doubted if any, save only the ichneumon, can vie with the ladybird in this respect. Its life is spent in the pursuit and destruction of the aphis, which, were it not for its vigilance, would so increase that it would become, in temperate climates, as great a scourge as is the locust in the localities it inhabits. Not only does the ladybird as a perfect insect live upon the aphis, but in its earlier, though less known, stage it is equally destructive to them, and from the time when it issues from the egg to its death its whole life is passed in the destruction of these pests of the farmer and gardener. In its labours this way it is ably assisted by the larvæ of the Hemerobius, which, in its perfect state, is a brilliant four-winged fly ; and by those of the Syrphidæ, which transfix and devour their thousands on their trident-like mandibles. But these creatures, useful as they are, are far less common than the ladybirds, which are to be found on every plant, and, being amongst the earliest insects to make their appearance in the spring, are ready to meet the first invasion of the aphis. It may frankly be admitted that the ladybird is not, in this work of destruction, animated solely by a desire to benefit man, and

even that this is quite a secondary matter in its opinion. This, however, may be said of many other recognised benefactors of man. The bullock is considered none the less a benefactor because he eats, not with the express purpose of making flesh, but to gratify his appetite; while the sheep values his warm coat rather because it keeps out the cold than because it will some day furnish man with a garment.

There are a great variety of ladybirds, differing only in the colours and markings of their coats; these are for the most part red, black, or yellow, with black, yellow, or white spots. The red with seven black spots is the most common, and is found all over Europe and in parts of Asia and Africa. It is everywhere a favourite with children, and in France they are called *Vaches à Dieu* or *Bêtes de la Vierge*, and are considered sacred to the Virgin. Why this should be so is not very clear, but it would be much more easy to find explanations for the title than for the verses that especially endear them to children throughout this country—

“Ladybird, ladybird, fly away home,
Your house is on fire, your children alone.”

There are two or three versions of the last two words, but all alike express that there is danger to the children as well as to the house. The antiquity of this legend is prodigious; it is one of the group brought by the earliest arrivals in Europe from the Far East, and there can be little doubt that it came to us from Scandinavia. It is familiar to children, with but slight variation, all over Europe, and African children repeat an almost identical sentence over the ladybird. As the legends current in Europe and Asia are but

seldom found among the sons of Ham, it does not seem by any means beyond the bounds of probability that the legend was in existence before the Flood, and that the children of the sons of Noah carried it to the various quarters of the world when they scattered from the common centre.

But, though there can be no dispute as to the enormous antiquity of these apparently non-sensible lines, scientific men, although agreeing that there must be a deep and hidden meaning somewhere, are quite unable to arrive at any consensus as to what that meaning can be. As of late years it has been the habit of scientific men, whenever they cannot find any other satisfactory explanation of an ancient legend or story, to assign it to one of the sun myths, "Ladybird, ladybird," must now be considered as included in that broad category, and so takes its place by the side of the siege of Troy, the wars of the Gods with the Titans, and other apparently widely diverse legends. The highest credit is due to scientific men for the ingenuity shown in the invention of this sun-myth limbo, into which they are able to shunt away all legends and traditions that prove too tough for them to unravel. But, failing to grapple with the story of the burning of the ladybird's house, it would certainly be satisfactory if we could get with certainty at the legend that connects them with the Virgin. The French call them *Bêtes de la Vierge*, the German *Unser Herrenhuhn*, while our own ladybird, which is, of course, a mere shortening of "Our Lady's bird," is a literal translation of the German name, the French differing only in calling the insect a beast, while the Germans and ourselves call it a bird. The most plausible supposition is that as the Virgin is in

many Catholic pictures depicted as pierced to the heart with seven swords, the seven black spots on the red ladybird are considered as typical of those wounds, the form of the little creature being not unlike that of a heart.

Seeing the extreme value of the ladybird's assistance as a destroyer of the green fly, it has more than once been seriously proposed to introduce breeding establishments for its multiplication ; and there can be no doubt, were this practicable, agriculturists, and especially hop-growers, whose vines are cruelly ravaged by the green fly, would benefit vastly. The silkworm is bred in enormous quantities, and there seems no reason why the ladybird should be less susceptible of cultivation, if it could but be taught to lay aside its habits of restlessness. Unfortunately, the ladybird is a frequent and rapid traveller, and the hop-grower would have no assurance that his neighbour's gardens would not benefit more than his own by his labours in breeding it. Few beetles take so readily to the wing ; it runs fast, too, on the little legs packed so snugly away under the flat side of its hemisphere. Still, as the flea can be taught not to jump, it ought to be possible to restrain the ladybird from flying ; and, in that case, if kept amply supplied with its favourite food, it might be content to breed in captivity, and the management of such an establishment would be a source of great interest and amusement to children. Owing, perhaps, to its immunity from cruel treatment at the hands of man, the ladybird exhibits no fear whatever of him. While the spider will rush to a hiding-place, the caterpillar drop itself from a twig, and the flea endeavour to escape by the aid of its prodigious activity from the touch of man, the ladybird will run unconcernedly across his hand, and, indeed, appears

to take a pleasure in so doing, until, tired of the amusement, it opens its wing-cases, and, after a preliminary flourish of its wings, goes off in a swift flight in search of its next meal. Properly trained, the ladybird ought to be a skilful performer of tricks, although we are not aware that any efforts have been made in that direction, but a regiment of them drilled as soldiers and taught to manœuvre accurately to the sound of the bugle should certainly be an attractive spectacle.

THE DOG.

OF the various works of man, there are few of which he has more reason to be proud than the transformation under his hands of the wild dog into the domesticated animal. The change was not early effected; during Scriptural times it had made but little progress. The term "dog" is everywhere used as one of opprobrium. "Is thy servant a dog that he should do this?" is in itself sufficient to show that the possibility of the dog being possessed of many virtues had never occurred to the speaker. The dog was, indeed, regarded down to comparatively modern times in three lights only :. as a scavenger, as a guard against wild beasts, and as an assistant in the chase, and it is thus that he is still viewed in the East and by uncivilised peoples. It must be owned that the wild dog, or the dog such as he exists on sufferance in Oriental communities, has but few higher claims, that he is by nature but little in advance of his cousins the wolf, the jackal, and the coyote, and that he is cowardly, cringing, and ferocious according to circumstance. His virtues, in fact, are at this stage altogether latent; he has been cowed by a long course of misapprehension and ill-treatment, and displays only his worst qualities. It is as difficult to recognise him as a near

relation to the civilised dog as to see the connection between a Digger Indian and a Shakespeare or a Newton. It is, then, no small credit to man that he has discovered and brought out the grand qualities of the dog, and that in making him his companion and his friend he has developed virtues equal to those he himself possesses.

It may be said that there never was a man who possessed the proud stateliness of the St. Bernard, the unerring sagacity of the sheep-dog, or the courage and tenacity of the bull-dog. The vainest masher is not daintier in his ways than the Italian greyhound, or more soft and affectionate than the Blenheim. In point of fun and vivacity the terrier in its many varieties stands higher, while in the exhibition of unwearied devotion, fidelity, and affection, the whole race put man to shame. Although rejoicing in undivided affection, the dog is yet contented with an occasional word from his master, he always renders prompt and cheerful obedience, is ready to spring up a score of times from the most comfortable sleep by the fireside in answer to his master's voice, and is willing at once to abandon the most comfortable quarters to brave all weathers if his owner will but deign to take him with him. He will face any odds in his defence, and will die in his service. Even roughness and unkindness fail to shake his devotion, and in adversity as in prosperity his fealty is unbroken. The dog is a fine discriminator of persons, and while a well-attired stranger who approaches his master's house will be greeted with silence, or perhaps with a slight wag of welcome, his back will bristle and his demeanour become unmistakably hostile as soon as he perceives a tramp approaching. Dogs are judges of character too, and no coaxing or

blandishments will seduce them into friendliness with one of whose disposition they disapprove, and it must be owned that, like children, they are seldom mistaken in their intuitive likes and dislikes.

A flesh-eater by nature, the dog adapts itself readily to the habits of those around. His preferences are for meat, but few things come absolutely amiss to him : bread and cheese, fish, pies and puddings of all sorts, vegetables, and even fruit, are eaten by him with apparent relish, and he needs but very little education to take to beer, wines, and spirits. As might be expected from the analogy of man, the big dog, as a rule, is much more gentle, patient, and good-tempered than the small one. The latter is ready upon the smallest provocation to become excited or pugnacious ; he seems to be on the look out for affronts, and ever on the watch to assert himself. The big dog, upon the contrary, is generally quiet and dignified, and very slow to wrath. While careful breeding has brought about great varieties in size, form, and appearance, its effects upon the dog's mental organisation can scarcely be traced, save for such differences of disposition as are the result of size rather than race. The St. Bernard and the toy terrier, the pug, the poodle, the Dachshund, and the spaniel, although differing as widely from each other in appearance and shape as if they belonged to different families, are yet identical in their possession of the virtues and methods of dogdom. Their habits may differ slightly, some seeming to find their chief happiness in lying asleep on a soft cushion, others in an incessant pursuit of rats and other vermin, some in accompanying their masters to the chase. There are dogs whose greatest joy is a swim,



"CAREFUL BREEDING HAS BROUGHT ABOUT GREAT VARIETIES IN SIZE, FORM,
AND APPEARANCE."

others whose chief object of life seems to be to pick a quarrel and then fight it out. But these differences are no greater than those we find existing in men—even in men of the same race. It does not require a very wide range of acquaintance to enable us to fix upon a man whose tastes correspond respectively to those of one or other of these types of dogs, and, indeed, the list might be almost indefinitely extended. This is not remarkable, since it is man who has made the dog what he is. No such varieties of character are to be found in the wild dog, and even the semi-civilised dog of Constantinople, or other Eastern towns, resembles his brethren as closely as one sheep in the fold does another.

The Red Indian expects confidently that his faithful hound will be his companion in the chase in the country of the Great Manitou, and there are not a few Englishmen who, deep down in their hearts, believe that the separation between themselves and their affectionate friends and loyal servants will not be an eternal one. They would repudiate the idea that there was a future before other animals, unless an exception were made in behalf of a favourite horse; but the dog has assimilated himself so closely to man, has become so much his companion and friend, that it is not difficult to a real lover of the dog to suppose that it too may have a future before it. At any rate, in a comparison between the dog and the man, the advantage is not always with the latter; and few would deny that in point of intelligence, of generosity, and nobleness of disposition, of fidelity to duty, of patience and of courage, there are some dogs that are infinitely the superiors of some men. It was not so long ago that, in discussing the

muzzling question, a man writing to a newspaper said, "Better a thousand dogs should die than one man!" There are very few men who, appreciating dogs, would at all agree with this opinion. There are men whose lives are more valuable than those of a thousand dogs, but there are others whose lives would be dearly purchased by that of one dog.

It is possible that if admitted to as intimate a companionship with man, other animals might make as rapid a rise as the dog has done; but there are few so well suited for that companionship. The cat accepts kindness, but declines to be in any way bound by it. It may like petting, and may even run to greet a master or mistress, and follow them over the house; but the cat takes little interest in their conversation, and keeps its thoughts strictly to itself, and its inscrutable face is a mask which cannot be penetrated. But beyond the cat the choice is limited. Rats and mice are easily tamed, but would never overcome feminine aversion. Sheep lack the liveliness necessary for a pet. Cattle are too large for our present style of house; while the giraffe, whose eye is probably the most lovely of those of any of the brute creation, would scarcely feel at ease in a drawing-room. Lions, tigers, and other members of the cat tribe have been made pets when young, but become dangerous as they gain their strength. The monkey is too intolerant of cold to become a pet in this country, and his restlessness and love of mischief are against him. The mongoose, perhaps, if more common, would be the most formidable rival of the dog. It is admitted to possess a high degree of intelligence, to be easily tamed, and very affectionate; but it could take the place only of

the smaller varieties of dogs, and would fail from its want of voice as a guard, and be of little use in a tussle with burglars. Take him altogether, there is no animal possessing one tithe of the qualifications of the dog for the various purposes for which he is used by man, being capable of acting alike as a woman's pet, as a man's companion, as an assistant in the chase, as, in some countries, an animal of draught, as a vigilant sentry, as a powerful and valiant ally, and as the most faithful and truest of friends.

SHEEP.

THE position of the sheep in the scale of the animal creation has not yet been assigned. Naturalists, who are guided by mere externals, have, indeed, agreed that the sheep is a quadruped, that it is herbivorous and ruminant; but, after all, this does not help us much. Physically, the sheep may stand high; mentally, it appears to be about on the level of the garden slug. The sheep eats continually, and when he is not eating, he is chewing; this gives him a thoughtful appearance; but no savants have ever ventured a suggestion as to the subject of his thoughts. He has his good points as a producer of wool and mutton, but the garden slug is edible and nourishing, and the caterpillar yields a most valuable product for clothing; therefore this fact cannot be considered as bearing upon the subject of his place in the scale of creation. In its wild state the sheep is said to be sagacious, but the stories of huntsmen, like those of fishermen, are to be received with marked distrust. If the sheep is sagacious in its wild state, why should it become so densely stupid when domesticated? The dog and the negro improve immensely in intelligence from contact with man, and are both capable of attaining a high degree of reasoning power. Dogs cannot, indeed,

speak, but they certainly understand much of human speech, and learn to read the wishes of their masters at a glance. Negroes attain to the point of being able to preach sermons—a low test of intellectuality certainly, but still a proof of some intelligence.

It is difficult to believe, then, that the sheep can have deteriorated mentally from contact with civilisation, and it must be assumed that any supposed sharpness of the creature in its wild state must be due solely to the fact that it is difficult to approach, and crafty in eluding pursuit. But in these qualities the domestic flea is surely its superior; and most insects, either by feigning death, by speed in running or flying, or by tricks of hiding themselves from observation, show higher powers of self-preservation than the most enthusiastic admirers of the sheep can claim for it. It is true that the sheep makes up for its lack of intelligence by its preternatural gravity and thoughtfulness of demeanour. Were every quadruped half as wise as the sheep looks, it is clear that the dominion of man over the animal creation would be played out. The ovine vocabulary is limited. The sheep has, in fact, but one sound, which it is so proud of that it is continually making it. Whether calling its offspring, or protesting against being driven along a high road, or as an utterance of opinion as to the appearance and speed of a passing railway train, it raises this cry with precisely the same inflection and vigour.

Attentive observers have been of opinion that, like the dog and cat, the sheep expresses emotion by different movements of its tail; but none have attempted to classify these varieties of motion or to analyse the emotion contained by them. Like most timid creatures the sheep is crassly



“ADDICTED TO THE CHILDISH PASTIME OF FOLLOW-MY-LEADER.”

obstinate, and will object to be driven into a pen, even though the interior be scattered thickly with the succulent turnip, and nothing short of prodding with a stick, assisted by barking on the part of a dog and bad language on the part of the shepherd, will induce it to enter. The animal, except in early youth, has no idea of humour ; and even on the part of the lamb, playfulness is expressed only by a little frisking of an incoherent character. It has been said that the sheep is capable of attachment to persons ; and an American ballad specifically states, that a lamb belonging to a young person of the name of Mary followed her wheresoever she went. The fact, however, that the circumstance should have been considered worthy of chronicle in verse shows its great rarity. One of the peculiarities about sheep is the extreme similarity of feature which characterises the individuals of the same breed. Nature, which so loves variety that it is said that no two leaves in a great tree are exactly alike, gave up the sheep as hopeless. The straight forehead and nose, the lack-lustre eye, admitted of no variety short of complete change, and even the interference of man, although it has created many varieties in size and coat, has done nothing to alter the face ; it remains in its normal state of uniform stolidity. Lambs, indeed, recognise their mothers among a flock ; but it is probable that the sense of smell rather than of sight enables them to do so.

Even the poets, who have managed to say something for most animals, have been unable to invent anything favourable concerning sheep ; and silly has been their favourite epithet for it. The poet who has apparently devoted most attention to their doings, goes so far as to say that a flock,

of which he is writing, on a certain occasion left their tails behind them. This, of course, must only be regarded as a metaphor, his meaning being that they were wholly destitute of memory. Scriptural authority would seem to show that the sheep is a superior animal to the goat, and no doubt it is less given to mischievous tricks; but as this is due to a want of sufficient intelligence to devise a mischievous trick, it can hardly be considered a feature worthy of high commendation. Some have supposed that the sheep throughout its life is oppressed with a sense of duty which deadens all other faculties. Having in some mysterious manner become possessed of an hereditary knowledge that the object of its life is to furnish mutton, it sets itself deliberately to work to prepare for the butcher's knife. To this end, it is always eating when it is not sleeping. Its stolidity is assumed because it knows that energy is destructive to the formation of fat. Unfortunately for the reputation of these animals, their breeders have regarded them solely in the light of producers of mutton and wool, and have endeavoured to improve them only in this respect. Had they turned their attention to developing their mental qualities, the consequences might have been different; but naturally the sheep, finding that no efforts were being made to improve its intelligence, accepted the place in the animal creation that man assigned to it, and has taken no pains to improve itself. There is no saying what a society for the improvement of the intelligent faculties of sheep might not effect, and if its efforts did but produce some change in the expression of their faces it would be a boon to mankind. There is a limit now to the pleasure which any one save a breeder can obtain

from the contemplation of a flock of sheep, and this simply from the want of variety. It is true that Phyllis and Daphne, and many other maidens, have taken to the tending of sheep ; but as it is palpable that the attractions of the calling were the shepherds and not the sheep, this proves nothing.

To be able to obtain a fair idea of the stupidity of sheep it is necessary to see them, not when engaged in tranquil mastication, but while driven upon a high road. The manner in which they persist in placing themselves under the wheels of any passing waggon or cart is remarkable, and would seem to show that even the instinct of self-preservation, which is so marked in their wild state, is altogether lost in the domestic animal. Singularly enough, they are addicted to the childish pastime of follow-my-leader, and wherever one goes the rest will follow, even if it be in a jump over a cliff to certain destruction. It has been urged in favour of sheep that they are affectionate mothers, and will defend their offspring against attack on the part of dogs. This, however, can scarcely be considered a fair reason for placing them high in the scale of animals, as some insects, such as ants and bees, will defend their young even to the death ; while as to the affection of the sheep, any one who has watched it suckling its lamb must have been struck at the absolute indifference of its attitude and its evident mute protest against the proceeding. There are many other points which might in an exhaustive essay upon the sheep be touched on, for example the ridiculous febleness of its attempt to be a formidable and dangerous assailant, as expressed by short stamps of the feet, a pretence which fails to impose upon any one.

Enough, however, has been said to show that the sheep, although classed as a quadruped, is really as an animal an impostor, and that its true place in the scale according to its mental attributes should rather be among the molluscs than the vertebrates.

THE BEE AND THE WASP.

IT is undeniable that the bee occupies a far higher position in the regard of man than the wasp. The bee is held up as an example to the young for its strict attention to business, its forethought and prudence. It has been made the object of much study; its habits and manners have been watched in hives specially constructed; and the behaviour of the bees towards their queen and towards each other has been as minutely investigated and described, and is, indeed, almost as well known, as are the customs of the ancient Greeks or Romans. The wasp, on the other hand, is regarded with absolute hostility. It is viewed as an idler, as an irritable and hot-tempered creature, with no fixed aims and ends, prone to unprovoked assaults, a disturber of picnics, an intruder in the domestic circle—a creature, in fact, to be promptly and summarily put to death if opportunity offer itself. This hasty and unjust conclusion is, in fact, the result of man's natural selfishness. He does not really admire the bee because the insect stores up food for its winter use, but because he is able to plunder that store, and to make it available for his own purposes. The squirrel, the field-mouse, and many other creatures lay up stores for winter; but, as man is not

particularly fond of dried nuts or shrivelled grain, he does not consider it necessary to profess any extreme admiration for the forethought of these creatures. The wasp is perfectly capable of storing up honey for its winter use, did it see the slightest occasion for doing so; but the wasp is not a fool. It knows perfectly well that its life is a short one; that it will die when the winter season approaches. Its instinct doubtless teaches it that only a few of the autumn-born females will survive to create new colonies in the spring, and that as these females will pass the winter in a dormant state in some snug recess beyond the reach of frost, there is no occasion whatever to prepare stores of food for their use. Did the wasp endeavour to emulate the bee, and store its cells with honey, it would rightly be held up to derision as an idiot, as the only creature who imitates the folly of man in continuing to work until the last to pile up riches for others to enjoy after its death. If it is admirable for the bee, who lives through the winter, to collect for his use during that time, it is no less admirable in the wasp, who dies before the winter, to avoid the absurd and ridiculous habit of collecting stores which he cannot profit by.

In all other respects the wasp is the equal, if not the superior, of the bee. The latter is content to establish its home in any place that comes to hand. Even if man provides a hive for it, the bee has not the sense to utilise it until man takes the trouble to bring the habitation and to shake the swarm into it. If the hive should not be forthcoming the bees will establish themselves in a hollow tree, in a chimney, in the roof of a house, or in any other place that appears convenient, and then and there begin to build their combs and prepare for the reception of brood and honey. The

wasp, on the other hand, more industriously sets to work to build its own house, walls and all, and the labour required for such an undertaking is enormous. Wood, the material it uses, is obtained by gnawing posts, gates, rails, or other timber that has lost its sap. This is chewed up by the wasp's strong jaws into a paste, and spread out with its tongue in layers finer than tissue paper. Layer after layer is spread, until the house, which varies in size from that of an apple to one as large as a man's head, is made rain- and weather-tight, a model of symmetry, and a marvellous example of the result of patient and persevering labour, a white palace, by the side of which anything the bee can do is but poor workmanship. The arrangement inside the structure is at least equal to that which the bee can accomplish in the most perfectly-constructed hive. The cells are as regular and as carefully arranged, and it is kept with the same scrupulous care and cleanliness. It is not necessary for the wasp to collect honey and pollen for the use of its brood, for these are fed upon insects, the juicy caterpillar and the plump body of the blue-bottle being the morsels which they mostly affect. In the capture of its prey for the use of its young, the wasp works as assiduously as does the owl to gather in field mice for the sustenance of its offspring; and each capture, after being carried to the nest, is stowed away in the cell with the egg, until it is full, and then the entrance securely sealed.

The queen wasp is, in point of activity, energy, and intelligence, far ahead of the queen bee. As soon as the latter leaves her cell a perfect insect, she is waited upon by a crowd of workers, who provide her with food, attend her every movement, and forestall her every wish, and her functions are confined solely to the laying of her eggs. The queen wasp,

on the contrary, is the founder as well as the mother of her colony. When she wakes up from her lethargy in the spring, she sallies out to find a suitable spot for her future kingdom. Having fixed upon it, she proceeds to build her cells unaided. She has to feed herself while engaged on this labour, and when a certain number of cells are completed she has then to store them with food sufficient to support the grubs, until, their second stage completed, they are ready to issue out and to take their share in the work. Even when she has an army of children, she continues to set them an example of labour and perseverance, supervising the operations and working diligently and continuously herself. She is the life and soul of her community, and if by any accident she dies before the other females, which are hatched late in the season, appear, the community is entirely disorganised, the neuters cease from their labours, and the whole colony perishes. Nature, too, has done much more for the bee than for the wasp, for the former naturally secretes the wax from which it forms its cells, while the wasp has no such faculty, and has to construct its cells as well as its house from the paper it manufactures.

The wasp is as fond of sweets as is the bee, and while a portion of the community are engaged upon the work of collecting materials, manufacturing paper, and building, the others collect sweets from flowers or fruit. Having filled themselves with these, they return home, and on entering the hive mount to the upper cells, and there disgorge the contents of their honey bag for the benefit of the workers. The bee is industrious, it may be admitted; but it is industrious in a quiet and methodical way. There is no hurry about the bee, and any one who watches it at work

will be inclined to admit that it does a good deal of pottering about. The wasp has no time for this sort of thing ; it knows how much there is to be done, and that there is not a single moment to be wasted. The queen is laying her eggs ; there are the materials for the houses to be collected, ground up into paste, and spread ; there is food for the grubs to be gathered, and supplies for the builders to be brought in. The work has got to be done, and there is no time to be fooling about. There is, then, no reason whatever for surprise, and still less for blame, that when the wasp is interrupted in its work it loses its temper at once. It is angry when, having entered at an open window, and gathered from a jam-pot, a dish, or a jug—for the wasp is not particular—a supply of food, it finds that its way back to its hungry friends is barred by a strange smooth obstacle, through which it cannot pass. Many men know to their cost how small a thing rouses the temper of a woman engaged in the arduous operations of washing or cooking, and are careful in avoiding the neighbourhood of the wash-house or kitchen upon such occasions ; and yet they make no allowance whatever for similar irritation on the part of the busy wasp ! Again, blame is imputed to the wasp because it waxes wroth if it be flapped at with a handkerchief or hat ; but surely there is nothing surprising in this ? Men take offence at practical jokes, especially practical jokes of a dangerous kind ; and the wasp naturally regards these wanton attacks upon it, when actively engaged in the business of the community, as dangerous impertinences, and is not to be blamed for resenting them. The more one examines into the habits of the bee and the wasp respectively, the more one is convinced that the high

esteem in which the former is held by man is simply the result of man's love for honey; and that the balance of superiority is wholly upon the side of the wasp, who is a more energetic, a more vivacious, a more industrious, and a more intelligent insect than the bee, and should on all these accounts occupy a far higher place in man's esteem and regard than it possesses at present.

THE BEAR.

NATURE, in creating the bear, bestowed upon it many good gifts. It is strong, robust, and hardy. It is warmly clad, and, moreover, can escape the hardships of winter by indulging in a prolonged sleep. One gift, however, was denied it—that of grace ; altogether, few animals are more clumsy in their gait and movements than the bear. It is strange that, this being so, the bear should be one of the few animals man has taught to dance. The majority of bears are vegetable eaters. Their claws are not, like those of the feline tribe, formed to tear or slay an enemy, but are designed for digging up the roots that form a large portion of its sustenance. As might be expected from the fact that it is a vegetarian, the bear is generally of an easy temper, and would be glad to leave man alone, if man would but let it alone. This amiability of temper by no means arises from want of courage. If their cubs are in danger, bears will attack against any odds, and if wounded are amongst the most formidable and savage of assailants. The polar bear, living as it does upon seals and fish, is by no means so peacefully inclined as the various species that exist on roots and fruit. It does not wait to be attacked, but at once takes the offensive, and

there are few more formidable foes. Bears are fond of sweets, the Asiatic as well as the American species both hunting diligently for the hives of wild bees, which their thick coats enable them to take in defiance of the efforts of their indignant owners. In captivity the animal is readily tamed. Unfortunately the bear possesses but few qualities that would render him of great use to man; had it been otherwise, doubtless it would have been tamed and kept in herds, for there seems no reason whatever why it should not have been as completely domesticated as the sheep and the ox. As, however, its hair is too coarse for working up into textile fabrics, and its milk-giving capacity is small, man has viewed it solely as an animal for the chase, and has hunted it down ceaselessly, the cubs only being occasionally preserved for exhibition in the Zoological Gardens, or with travelling showmen. In the latter case the bear shows great docility, readily learning to obey its master, and frequently manifesting a lively affection for him.



Next only to the monkey, the bear is unquestionably the most human of animals in its motions and gestures. In a state of nature, indeed, it rarely rises to its hind feet except

for the purpose of attack; but the fact that it is able to walk upon them, and that it frequently sits up on its haunches, and uses its fore paws as hands either for the purpose of putting food to its mouth, scratching itself, or rubbing its head, gives it a very human appearance. If wounded, too, it will sit up, and place its paws over the wound just as a man will do.

The American Indians held the bear in very high respect. This did not, indeed, prevent them from hunting it, but, before feasting on its flesh, they would always make a speech, begging its pardon, and deprecating its anger, upon the ground that they did not kill it from illwill, but simply from necessity. The bear dance, in which those engaged in it imitated the movements of the animal, was a religious ceremony, and generally the bear was regarded with respect far beyond that paid to any other animal. It is unfortunate for the bear that it did not from the first cultivate its power of walking upon its hind legs, for there can be no doubt that had it done so it would have stood much higher in the esteem of man. Valuing himself somewhat highly, man is naturally disposed to value animals that approach most nearly to him. The monkey is deified in some parts of India, and the bear might have stood in as high a position, had it but accustomed itself habitually to walk upright. It is true that it has none of the sprightliness of the monkey, but its gravity, its evidently good intentions, and the somewhat rustic awkwardness of its gait, would certainly seem to mark it as intended to be a more genial and friendly companion to man than the skittish and erratic monkey. The polar bear and the North American grizzly, the latter fast approaching extinction, come under a different

category altogether, and even the accomplishment of walking upright would have gone but a short way towards endearing them to man. The polar bear, indeed, differs widely from other species. In spite of his great bulk and power, he has none of that awkwardness that distinguishes the various land bears. He can run with considerable swiftness. He is perhaps the best swimmer of all quadrupeds, and is quick and active in his movements; but, upon the other hand, his face expresses none of the easy good temper of the ordinary bear, but it is at once fierce and sullen, watchful and alert.

The bear more than any animal conveys the impression of incompleteness, and it is difficult to avoid the belief that being slow of temperament it has taken much longer in its passage upwards from the germ than have other creatures. This being the case, it would be unfair to judge the bear as awkward or clumsy when in fact it is simply incomplete; and it is probable that in the course of another million years or so, when the cycle of its changes is accomplished, it will be an altogether different animal, distinguished for the grace of its movements, and for its still closer resemblance to man. The bear is perhaps more highly appreciated in Germany than elsewhere, it may be because the habits of the people approximate more closely to his than do those of the natives of other countries. At any rate it bears a conspicuous position in their folk-lore, and figures prominently in many a legend and story. It is probable that the tale dear to English children of the three bears was derived from German sources. The bear has by general consent been voted to be the characteristic emblem of Russia, doubtless because the peasants, wrapped up in skins

in winter, with hoods of the same over their heads, do present a very striking resemblance to him. The bear was once common in England; its bones are found plentifully



among those of other cave-inhabiting animals, and it was still numerous in the island when the Romans first conquered Britain; it vanished, however, even before the wolf, and has been nearly exterminated throughout Western Europe. It figured in the Roman arena, where it was probably goaded to a savagery altogether alien to its nature. It may be assumed that it was at one time regarded in the Old World with something of the superstition with which it was held in the New, being the only animal after whom two constellations have been named. Were there three of them, we should possibly be able to arrive at a satisfactory explanation of the children's story. It is remarkable that both bears are placed by the ancients in close proximity to

the pole, probably in delicate allusion to its climbing powers, as to the present day no bear pit is considered complete unless provided with a pole. It is evident that the ancient astronomers were wags, and while apparently

bent solely upon giving names to the constellations, were quietly poking fun at the unlearned. It would be difficult otherwise to account for the position assigned to Ursa Major and Ursa Minor, for there is nothing whatever in the position of the stars forming these constellations that in any way indicates the figure of a bear, the outlines of the various animals in the constellations being purely imaginative and arbitrary. It is somewhat singular that the bear did not figure among the signs of the zodiac, when such comparatively insignificant creatures as the ram and the fish were pressed into the service. Summing up the bear, it may be said that its good qualities predominate over its evil ones, and that it is man's fault rather than the bear's that they do not dwell comfortably and sociably together.

THE SPIDER.

THE want of balance in man's appreciation of things, and the unreasonable nature of his prejudices, are in nothing shown more strikingly than in the view he takes of the spider. His objection to the spider is based upon the fact that it kills its prey and devours it. So do the great majority of creatures on earth. The next objection is that it catches it in a net ; but for every fly the spider catches the fisherman will take a thousand fish, also in a net, and no one imputes it to him as harm. The fisherman, indeed, is regarded with a sort of special affection by the community. He is spoken of as the hardy fisherman, the honest fisherman, and, at any rate in his case, the fact that he catches his fish in a net is not considered in any way reprehensible. Then, it is urged against the spider that, having set its net, it hides from view, and, having enticed the fly into its bower, rushes out and devours it. But how about man ? The fly-fisher casts cunningly devised and tempting lures over the fish, while himself keeping, as far as possible, hidden from view. The trawler arms himself with glittering imitations of fish, studded with deadly hooks ; the wild-duck gunner paddles up noiselessly in a punt, and shoots down his birds while feeding ; or hides himself in a bower, and

brings them down as they pass unsuspectingly overhead. Man uses craft, and skill, and cunning to capture his prey of all sorts, and exults in his success. He would laugh to scorn the accusation that he was a lurking assassin, and yet he assumes a tone of lofty moral superiority towards the spider, who uses the gifts nature has bestowed upon him not for sport or amusement, but for existence. No spider is recorded as having employed a large body of his friends to drive up two or three thousand half-tamed flies to be slaughtered by him as a form of amusement. We have no doubt that such spiders as may be engaged about their business, within view of slaughter so perpetrated by human beings, must quiver in their webs with righteous indignation. Let us, then, have no more maudlin sentimentality about the cruelty of the spider. It obtains its food by the chase, and in so doing exhibits a skill, a dexterity, and a patience unsurpassed by any living creature.

The spider has a wonderful power of adaptability to circumstances. The great fat-bodied spider of our gardens is necessarily slow-moving, and therefore builds its web and waits. There are others less burdened by nature who are fierce and active, who hunt their prey on a sunny wall as a dog might hunt a rabbit, quartering the ground with restless activity, and pouncing upon the prey with the spring of a tiger. Some for preference build thick webs in dark corners, festooning cornices with filmy drapery, to the annoyance of good housewives. Others, tiny creatures these, will throw out a few threads, and, floating upon them, allow themselves to be wafted vast distances through the air. There is the water spider, who, long before man invented the diving bell, dwelt below the water, building its

nest there like a thimble, open at the bottom, and then laboriously carrying down little globules of air and releasing them beneath it, until the water is expelled, and it can dwell in the little silver bell it has prepared for itself. Then, too, there is the spider who builds for itself a box in the ground with a hinged lid as skilfully contrived as any of man's inventions, and, holding this tightly down, can defy the efforts of any foe likely to assail it. Not even the ant shows a wider intelligence, a more perfect aptitude for using the tools with which nature has provided it, and a greater power of adapting itself to circumstances than does the spider, and yet, while the ant and the bee are held up as examples to our children, the spider is passed over as an objectionable creature, of no account.

The spider is capable of being tamed, and has before now been made a pet of by prisoners, who have so domesticated it that it would come at their call, take food from their fingers, and come to treat them with absolute fearlessness, if not affection. It is not to be pretended that the spider possesses no bad qualities. Were it otherwise, it would stand on a far loftier level with man. With individuals of its own species it is exceptionally quarrelsome, and will not only kill, but eat a conquered adversary. It is, undoubtedly, an advanced socialist. So long as its supply of the viscid fluid from which it constructs its web holds out, it will build its house and defend it against all comers. But when this is exhausted, it immediately adopts radical principles, and upon the theory that there is no right in property, proceeds at once to rob a neighbour of the fruits of its labour, and to instal itself in the property from which it has ejected the owner. It is a little singular that

the socialists have not adopted the spider as the badge and emblem of their creed, in recognition of the identity of their principles.

Unhappily, a far darker blot than this rests upon the character of the female spider, who is much larger and more powerful than the male. She is an excellent mother, and will defend her bag of eggs with her life; but she is a mournful example of the working of the rights of women carried out to the fullest extent. This can never occur in the human race, because, fortunately for man, he is the stronger. Were it otherwise, we may be sure that that section of females who clamour for equality would be content with nothing less than absolute supremacy. The female spider lives up to this. Being the stronger, she does not argue with her husband, but when she has no further use for him she simply kills him and eats him. Looking at the matter from man's point of view, we are unable to find any justification for this conduct. Our escape from the fate of the male spider is largely due to the fact that our females are less strong than we: indeed, in spite of physical weakness they not unfrequently hold us in subjection, and occasionally rule us with a rod of iron. Metaphorically, they may devour us by their extravagance; but they have, happily, no ability to carry out to the fullest the methods of the female spider. The spider, it must be owned, stands almost, if not altogether, alone in the commission of this crime of uxoricide. So strange an exception is this to the general rule of nature, that one is driven to suppose that the female spiders must, perhaps in remotely distant times, have suffered from terrible treatment and ill usage at the hand of the males, and that having in course of ages

attained to greater strength than is possessed by their mates, they now revenge upon them the wrongs of their far back ancestors. We do not assert that this is absolutely the true explanation of their conduct ; but it is clear that some events of an altogether exceptional kind must have occurred in the history of the spider to bring about so unexampled and unnatural a state of things among the two sexes, and to embitter to such a degree the female against the male. It is lamentable to have to record so evil a trait in the character of one of the most intelligent and intellectual of insects, but it would be unfair to other and less highly gifted creatures were we to pass it over in silence.

THE GNAT.

HAD the gnat been endowed with as great a power of making itself obnoxious as its first cousin the mosquito, it would have been the subject of anxious inquiry and investigation by man. As it is, it attracts but slight attention, and lives and dies in undisturbed obscurity. In this respect it closely resembles what are called the working classes among man. The noisy spouter, the obnoxious demagogue, the troublesome striker attract attention; the vast patient herd live and die almost unnoticed. There is no reason for supposing, however, that the gnat takes the neglect of man to heart, fond as he undoubtedly is of man's companionship. In this respect he stands almost, if not quite alone among created things, for the attentions paid to man by the flea, the bug, and the mosquito are strictly selfish. Gnats, however, appear to be purely disinterested in their attentions, and to regard the doings of man with pleased and curious interest. They will attend him in his walks, flying in a cloud over his head or a pace or two in front of him; while their interest in him when engaged in fishing, sketching, or other pursuits is unbounded. They do not, like the midge, interfere with him in any other way, but keep at a respectful distance. A

young couple strolling through a lane as the shades of evening are falling are a spectacle specially attractive to gnats. They will frequently on such occasions form themselves into filmy clouds, rising and falling in rhythmical measure, expressive of satisfaction and good-will.

The summer evening gnat must not be confused with a cousin of his which occasionally infests low-lying and marshy neighbourhoods. This bears both in point of size, appearance, and habits, a much closer relation to the mosquito than to the gnat, and it may, indeed, be termed the English mosquito. It is many times larger than the gnat which is the subject of our remarks, has dark limbs and body, a stinging proboscis, and a bare head. The gnat is scarce more substantial than a cobweb, and has upon its head a lovely plume. It is silent, or, at least, if it utters a sound, its vibrations are too rapid for the ears of man to detect.

The life of the gnat, although short, would seem to be more full of pleasure and enjoyment than that of any other creature. Other insects that consort together in large numbers do so for mutual convenience or protection. Multitudes are needed for the various work of the bee, wasp, and ant cities. Caterpillar communities dwell together, partly because they were born so, but probably more because the web, their common work, is a protection against their enemies, and specially against their most deadly foe, the ichneumon. The aphis feed crowded in close herds, but their power of locomotion is so small that they live and die where they were born. Gnats, however, congregate simply to enjoy the companionship of their friends. Their gatherings are great balls and dances. Flying in a soft

cloud scarce more palpable than steam, and ever changing in form, they rise and fall in constant motion, and it is impossible to doubt that this action partakes, to some extent, of the character of a dance. A faint, low hum accompanies the motion, caused partly, perhaps, by the beating of the innumerable gossamer wings, partly by the whispered conversation or song from innumerable throats. Naturalists have puzzled themselves in vain for any explanation of the object of these dancings. The natural one, that it is the outcome of a joyous and happy disposition, an exercise expressive of pleasure and happiness, is too simple to be received with approval by the scientific mind.

Man does not so rejoice in his existence. He has not such unbounded satisfaction in the companionship of multitudes of his fellows, nor throughout all nature is there any parallel to the great gatherings and dancings of the gnats. Flies, indeed, do join in sportive chases and flights, but these are engaged in by few individuals only. Flights of starlings and some other gregarious birds approach more nearly to the gnat assemblies, and are also frequently marked by rhythmical fallings and risings; but they are comparatively short outbursts of playful joyousness, and not comparable with the constant and prolonged dances in which the gnat spends the greater portion of its existence as a perfect insect. Well may the gnat be transparent, for it is doubtful whether it takes any solid food from the time of its emergence from its pupa case to that when, its existence terminated, it drops lifeless on the surface of a stream. It drinks, however, and a dewdrop is sufficient to afford refreshment to thousands.

The gnat's life, like that of most insects, is a dual one;

but unlike most others, the first—and much the longest portion—is spent in the water. The female gnat selects some quiet and sheltered piece of water, a stagnant pool for preference, and lays her eggs upon its surface. In form they may be compared to long small-bore bullets, pointed at the upper end. They are placed closely together and adhere lightly to each other, and when the tiny mass is examined through a magnifying glass it presents the appearance of a honeycomb studded with tiny points. If no accident befall it, the little raft floats until the young ones are ready to take to the water ; then the lower ends of the tiny tubes open and the larvæ swim away. Their life in the water resembles that of most other aqueous creatures. They feed upon organisms even more diminutive than themselves, and are the prey of the smaller water beetles and tiny fish. The gnat larva obtains the animalculæ on which it feeds by means of two ciliated organs on the head. These are in constant motion, and create a current by which its food is drawn into its mouth. But, though an inhabitant of the water, the gnat even in this stage is obliged to breathe, and therefore frequently ascends close to the surface, where it draws in the air through a little tube situated at the apex of the body.

At the end of about fifteen days this state of its existence is completed, and it assumes the pupa state. It is now doubled up, and somewhat rounded in form, but it is, nevertheless, still active ; it still breathes, drawing in the air by two little tubes, situated now on the anterior part of the body. When the perfect insect is formed inside the pupa case, the air contained within the latter causes it to float on the surface. The gnat breaks through the upper side

and stands upon the skin it has quitted, which serves as a little raft until it has attained sufficient strength to fly. This is the most critical moment of the gnat's existence; the fluid in which it has lately existed would now be fatal to it, and the tiniest ripple caused by a breath of wind, or the passage close by of a fish or water beetle, before the gnat has gained strength to fly, would upset the boat and drown its occupant.

Man has not been able to solve the problem whether thought as well as life is continuous during the three stages of existence of the gnat, or, indeed, in those of any other insect; and knows not whether the gnat has any remembrance of the very different existence it passed beneath the surface of the water over which, in its perfect state, it delights to disport itself. The fact that all insects deposit their eggs in situations unsuitable for their own existence, but suitable for that of the larvæ, is no proof for or against the theory, since it may be the result of blind instinct only.

Whether man will ever be able to place himself sufficiently *en rapport* with the lower creation as to be able to solve this and many other problems must be left to future ages to determine. So far, able as he is to acquire with more or less difficulty the languages of all other varieties of man, he has failed signally in comprehending that of even the birds and animals with whom he is most in contact. The dog and the horse are in this respect distinctly his superior, and the former, when admitted to close companionship, unquestionably understands at least the gist of his master's words. As it is not the custom of the gnat to waste its strength by travelling ahead in a straight line, we have no means of determining the actual rate of speed at which it can fly.

That it is very great is certain. A swarm of gnats caught in a heavy rain-shower will continue their gyrations apparently undisturbed, their sight and movement being so quick that they are able to dodge the raindrops in their descent; and at the termination of the storm, however heavy, their numbers will be apparently undiminished. This would seem to show an amount of speed and activity relatively unrivalled in any other living creature.

THE ANT.

THE ant has been so thoroughly exploited by Sir John Lubbock and others, that it is altogether unnecessary to enter upon any description of its customs and habits. It may at once be assumed that, for its size, it is the most intelligent of all created beings. Were each particle of the brain of man animated by a vigour and sagacity equal to that which vivifies the tiny speck of brain matter in the head of an ant, imagination altogether fails to picture the result, or to appreciate even faintly the wisdom and power that man would in that case possess. But even as matters stand, we may with advantage learn much from the ant, especially from the more highly organised tropical varieties, in which we may include the termite, popularly known as the white ant, although in reality belonging to another family. Here we see regular communities dwelling together, governed by their own laws and customs, and exhibiting the spectacle of a nation acting in accordance with natural laws. It must be painful to republicans to find that in the great majority of communities of what we are pleased to consider inferior creatures, the monarchical principle distinctly prevails. In ants, bees, and wasps, the most completely organised of such communities, there is a natural head, not elected or

chosen by vote, but born to the purple. Among animals that congregate for mutual protection and convenience, such as horses, stags, and elephants, there is always a leader ; but in this case he assumes the position by right of superior strength, valour, and sagacity. No scientific man has been able to discover in his election to the post any trace of the process known in the United States as lobbying. There is neither intriguing nor currying for popular favour—the strongest and bravest assumes the position by right of his strength and bravery, and may be termed a natural dictator. These communities are evidently inferior in order and perfection to those of the first class.

Thirdly, come creatures of duller brain, of which the sheep may be taken as a type. And here we come to nature's example of a republic, the dull level of equality and fraternity, where none are superior to others, and there is no emulation, no gradation of rank, and no rising of one individual above the rest. One cannot doubt, with these examples before us, that Nature has very clearly pointed out that in all highly organised communities the monarchical system is that best adapted for securing order and progress, and for the general benefit of the whole ; that for those in a less advanced stage of progress a dictatorship is the preferable form of government, while among those of the lowest type of intelligence a republic serves the purpose as well as any other system.

In the ant nation, which stands at the head of such communities, the monarchical principle is carried out to the fullest extent. We have the Queen, the ruler and mother of the whole ; her courtiers, who attend upon her ; the military class, who may be considered as the nobles, who

do not labour personally, but furnish the fighting and are ready to die in defence of their country. The overseers, generally larger and more intelligent than the mass of workers, direct the operations, chastise the indolent, see that all is done with order and regularity, and generally supervise and control the operations. These may be taken as the type of the middle class, the merchants and manufacturers. Then there are the nurses, who take charge of the eggs, feed the young, transport the pupæ into the sun, and carry them back into the recesses of the city when rain threatens; while below them are the bulk of the community, the labourers and masons, the huntsmen, and the cowherds who tend the insects from whom the ants obtain a supply of natural honey. Lastly, there are the slave population, captives in war, who are the servants of the whole community. The result of this perfect combination of labour is the erection of edifices, by the side of which man's greatest efforts are in comparison utterly dwarfed and puny.

One reason of the great success of the ant communities, and of the perfect order and regularity with which they conduct their operations, is that strikes and labour combinations are unknown to them, and all classes are content to do their allotted work contentedly, willingly, and zealously. It must be painful to members of peace societies to know that they are warlike in the extreme, and that among them the principles of universal brotherhood have made absolutely no progress. The bravest knight of the days of early romance, riding out to attack the giants, was but a poor creature by the side of the warrior ant, who will do battle fearlessly with the largest and strongest animal that may

venture to disturb the peace of his city, and, having once fixed his hold upon his foe, will suffer himself to be torn limb from limb without relaxing his grasp. Advantage is taken of this extraordinary tenacity of grip by some primitive peoples, who, if suffering from severe cuts, draw the edges of the wound together and then apply ants, who fix their jaws one on each side of the cut. The bodies of the insects are then nipped off, but the heads retain their grip, and form a perfect suture until the wound is completely healed.

Well it is for man that the scheme of Nature did not bestow upon the ant bulk as well as wisdom, valour, and industry. Had the ant been only of the size of the domestic cat, he would have been absolutely Lord of Creation. The fishes alone would survive. A single ant hill would furnish an army infinitely more numerous and formidable than the hosts of Tamerlane or Attila. The earth would shake under their tread; forests would fall before the power of their jaws; the elephant himself would be unable to resist their onset. Even now all smaller animals fly in terror at the approach of an ant army, and if overtaken fall victims to their furious assaults. Such an army, were the individuals no larger than mice, would yet be irresistible. Among the many reasons man has for gratitude to Providence, not the least is that the ant was not endowed with bulk in addition to its other gifts. To attain to the full power of its intellect, it requires a warm climate, differing in this respect from man, who suffers intellectually both from the extremes of heat and cold. The ant of temperate regions bears the same relation to the tropical ant that the savage of the tropical zone bears to the civilised

communities of more temperate climes. The ant of the villa garden and the red ant of the woods are but very ignorant savages compared with the termite, for while the one inhabits caves and tunnels in the ground, and the other rough huts, thatched with the spines of the fir, the white ant dwells in a palace far larger in proportion to its size than the abodes of the most powerful monarchs of the human race to that of their inhabitants.

It is not only man who may with advantage take lessons from the ant; the domestic hen would do well in one respect to imitate it. The white ant lays eighty-six thousand eggs a day throughout the season—an amount that may well cause the hen to be ashamed of her miserable total of three or four eggs a week. It is by no means improbable that the partiality of all birds for the pupæ of ants is less due to a gastronomic liking for them, than to spite at the superior fecundity of the ant. There would be a great future opened to the farmer if our scientific men could but discover some method of producing a bird which would be a combination of the domestic hen with the ant, uniting the size and tranquil habits of the one with something of the fecundity of the other. We should not demand the full tale of eighty thousand eggs a day; but even were that amount divided by a thousand, the result would still be satisfactory. The collection and packing of the eggs would furnish employment to the juvenile rural population, and eggs would become the commonest and cheapest of all diets. There is a book already in existence that gives instructions for cooking eggs in a hundred different ways. Doubtless many fresh methods would be discovered in preparing the abundant and nourishing food that would

be thus placed at the service of humanity. There would be the additional advantage, that the problem, now so much mooted, of our raising eggs sufficient for our consumption without dependence upon foreign sources, would be in this way finally solved. Whether such a much-to-be-desired consummation is to be arrived at by the inoculation of the hen with the blood of the female white ant, or by some other method, is a point that must be left to scientific men. It is only necessary for us to indicate a subject of research towards which their studies and investigations may be directed, with the certainty that, if successful, they would be of real utility to the human race.

THE BEAVER.

THE beaver is one of the animals that appear fated to die out under the encroachment of man. It has already all but if not quite, disappeared in Europe, and is rapidly dying out in America, although its final extinction has been greatly delayed by the substitution of silk for beaver skin in the manufacture of hats, whereby the value of the beaver has greatly decreased. In some respects the beaver is the most human of animals. It constructs houses, fells trees, and builds dams, and although it dwells in communities, each family has its own abode, separate and distinct from that of others. The sagacity of the beaver, and its resemblance to man in its actions and gestures, naturally cause it to be held in considerable veneration by the Indians, and it shares with the bear the first place in their esteem, although this feeling in no way prevents them from killing it when opportunity offers. It may be remarked parenthetically as somewhat singular that the Indians, although they have had the beaver always among them, have never taken to the wearing of high hats. It was for its flesh that they hunted it ; this was considered one of their greatest dainties. Whether the beaver entertains the same admiration for the sagacity of man as the latter does for that of the beaver, is a point that has not been determined. There can, however, be no doubt that it

regards him as a very formidable foe, and that it takes as many precautions to avoid his attacks as it does against those of its chief four-footed foe, the wolverine. It is to avoid the latter that it builds its houses with their entrances well below the level of the water, so that it can go in or out without fear of capture by the way. Against man it adopts another method of defence. It digs holes or caves in the banks of the river below the water level, and here it takes refuge when man attempts to break into its



house—in this respect following the example of many primitive peoples, who abandon their dwellings and seek refuge in almost inaccessible caves at the approach of a foe.

As might naturally be expected, the sagacity of the beaver has been exaggerated by report. It was said to be acquainted with the art of pile driving, and to use its tail after the fashion of a mason's trowel, in plastering and smoothing the exterior and interior of its house. These myths have been dissipated by more accurate observation. The beaver has no natural means of pile driving. Were it to endeavour to drive down a thick pile with its tail, it would

injure that organ to a degree altogether incommensurate with the downward impulse it would impart to the pile, and great as its sagacity may be, it has not been able to invent a pile driver worked either by mechanism or by steam. Its dams are formed from the trunks and arms of trees floated down to a shallow point in the stream; here they lodge, others are piled upon them, the boughs interlaced, and stones and clay from the bottom are heaped upon them, until the whole forms a solid mass, capable of resisting the stream even in flood. Where the flow of water is but small, the dam is constructed in a straight line across it; where it is liable to be swollen greatly by rain, it is built in a concave form, so as to break the force of the current. Man himself could not better appreciate the necessities of the situation. In streams where the supply of water is constant it is unnecessary for the beaver to build dams, as the purpose of these is only to maintain the water at a level sufficient to cover the entrance of their houses. Even in these cases the beaver often miscalculates the length of the wolverine's fore leg, and the latter will lie for hours patiently awaiting the passage in or out of a beaver, and then grasp it under water. That the beaver should allow the wolverine this opportunity detracts somewhat from its character for foresight.

The houses themselves are built much after the fashion of the dams, except that timber forms a smaller proportion of the mass, which is composed principally of mud and stones. Sometimes, especially when circumstances restrict the space available for house building, two or more families will live under the same roof, but each abode has its separate entrance, and privacy is thus preserved.

The beaver bestows no pains whatever upon the furnishing of its house, the interior of which is as bare as that of an Arab tent. There is a platform raised above the level of the water, where the beaver and his family can dry and comb their fur, they being more particular in the latter respect than the human female of the present day, whose tastes lie wholly in the direction of disorder and fuzziness. The habits of the beaver when at home have not been sufficiently studied to enable them to be described with any accuracy, the beaver having a marked objection to such investigations. That they are sociable in their habits is evident by the way in which they will congregate on the roofs of their houses, but whether they visit each other and have entertainments analogous to afternoon tea is unknown. It may be considered probable, however, that the females meet and compare notes as to their families and domestic arrangements; but, as it does not appear that any of the beavers stand to each other in the relation of master and servant, one of the most fruitful topics of gossip must be wanting. The beaver is not, like the otter,—the quadruped whose habits most closely resemble its own,—a fish-eater, but like its distant cousin, the vole, feeds entirely upon vegetables, its favourite diet being the stalk of an aquatic plant which in appearance resembles a cabbage stalk; it will, however, eat almost anything in the way of vegetables. In captivity its tastes become modified, and it will, like the dog, accommodate itself to circumstances, and eat meat, pudding, or anything else that its master may be taking. It is very easily tamed, and becomes extremely affectionate and attached to those around it.

As may be expected, nature in making the beaver a

builder furnished it with teeth of extraordinary hardness and wonderful cutting powers. These are composed of an extremely hard coat of enamel, the rest of the tooth being of a comparatively soft substance, whereby a cutting, chisel-like edge is obtained: the enamel growing as fast as it is worn away by use, a sharp edge is constantly maintained. So excellent a cutting instrument is it, that the Indians in the days before iron was at their disposal used to fix beaver teeth in wooden handles with which to cut bone and fashion their horn-tipped spears. The beaver can cut down trees of ten inches in diameter. It sits upon its branches like a squirrel while performing the work, and always makes one side of the cut a good deal higher than the other, by which means it is able to make the tree fall in any desired direction with an accuracy as great as that of the cleverest woodman.

It is a pity that the beaver has not been domesticated in this country, for a colony at work would be a most interesting feature in a park, and the young would furnish most amusing pets. Like many other animals, beavers when at work always place one of their number on guard, and the approach of danger is indicated by a loud-sounding flap of the broad tail. This tail, as the beaver climbs over its house in the course of construction, doubtless aids in smoothing down the surface, and they occasionally give a flap with it, but there is no reason for believing that it is used by them for the absolute purpose of plastering. It is much to be regretted that so interesting an animal is rapidly disappearing from the face of the earth.

THE SQUIRREL.

AMONG quadrupeds there is none that appears to enjoy its life more heartily, and to exhibit so much playful gaiety of disposition, as the squirrel. It is the type of liberty and freedom, of an airy joyousness, bound down neither by rule nor method, an incarnation of Bohemianism, and an existence free from labour, care, and restraint. The bird may have as joyous a life during the summer, but in winter its lot, if it tarry in northern climes, is a hard one indeed, while if it migrate south it has a long, arduous, and perilous journey to undertake, a journey to which countless thousands fall victims. The squirrel is free from these vicissitudes. In summer he frisks and frolics among the foliage of the woods, and during winter he sleeps away the time, snugly ensconced in the hollow of a tree, waking up only occasionally to feed upon the hoard of nuts or grain that he has providently stored away in anticipation of that time.

That the squirrel, with its pretty ways, its alertness, its activity, its bright eyes, soft coat, and bushy tail, has not become one of man's greatest pets is due to the squirrel itself. However tame and affectionate it may become—and it is capable of becoming both in a high degree—it is given to sudden alarms, and will then on an instant make its teeth meet in the hand that holds it, the effect being similar to

that which would be produced by four small chisels being driven into the flesh. It may be assumed that the squirrel has no direct intention of giving pain, but the result unfortunately does not depend upon the intention, and even a ferret requires no more careful handling than does a



squirrel. This peculiarity of the squirrel has militated to prevent any close affection and friendship between it and man, and has been the main reason for man's allowing it to go its own way and to enjoy its life in its own fashion.

In this country the squirrel does not multiply to an extent that would render it a scourge and a nuisance where it abounds. It may do some damage by gnawing young shoots

and buds of the trees, and the woodman may therefore be compelled to wage war against it, but the farmer does not reckon it in the list of his enemies, and upon the whole the squirrel lives its life unmolested. This is not so in the Western States of America, where the squirrel is among the most troublesome of the farmer's foes, causing terrible depredations among his crops. The variety there is not attired in the warm brown coat of its British cousin, but is striped black and grey like a tabby cat, and is a good deal larger than the English variety, with a magnificently large and bushy tail. So numerous are they in some parts, that upwards of a hundred thousand have been killed in the course of a year on a single estate.

Nature has been extremely bountiful to the squirrel in the matter of his allowance of tail, no other quadruped approaching him in this respect. The tail of the kangaroo may be as long in proportion, but from the hair being short and smooth it makes but little show, and is altogether lacking in the dignity of that of the squirrel; it is, too, extremely deficient in grace, being held out stiffly in rear, while the squirrel manages his as gracefully as a grand dame of the court of Louis XIV. managed her train. It is greatly to the credit of the squirrel that, adorned as he is by this exceptionally fine and bushy appendage, he does not, like the peacock, the turkey, and the bird of paradise, put on side in consequence; but except for the pains he takes in cleaning it and keeping it in the best possible condition, he seems to place no store on this his chief personal adornment. It is not quite clear what was the object of nature in thus endowing the squirrel, as we have been taught every organ has its special functions, and if one is ab-

normally enlarged it is because such enlargement was either essential to the safety of the individual, acted as a protection against his foes, or enabled him more easily to procure his food. But it is not very clear that any of these objects are served by the tail of the squirrel. He has few enemies, and although undoubtedly a long tail adds to the quickness with which an animal can turn, the squirrel has less occasion for extraordinary speed in this respect than have many other creatures who need it to elude the pursuit of their foes. But given the length of tail, its bushiness is probably an advantage to the squirrel, as it adds so very greatly to its bulk as to much reduce its specific gravity, and thus enables it to drop from bough to bough with almost the lightness of a descending feather. In point of speed, the squirrel is for its size probably the swiftest of quadrupeds, its movements being so rapid that the eye can hardly follow them, and for a short distance it would need a very swift dog to overtake it. With so many advantages in the way of speed, activity, and grace, in addition to those of its very handsome appearance, it is surprising that the demeanour of the squirrel affords no indication whatever that it has a particularly good idea of itself.

It is brimful of life, fun, and overflowing vitality; it delights in testing its powers, and exercises itself to the fullest for the mere pleasure of the thing. Kittens and puppies similarly amuse and enjoy themselves, but no other animal maintains through life the same love of hard exercise for its own sake as does the squirrel. Although so gay and sprightly, the squirrel is—unlike some bipeds of similar disposition—an excellent husband, faithful, domesticated and constant. He and his wife pair not for a season only, but generally for

life. After choosing a suitable home in the hollow of a tree, they snugly establish themselves there, bring up their families, store it with nuts and grain for the winter, line it with dry moss, and convert it into one of the most cosy of abodes.

The squirrel is gifted with a large share of curiosity; he takes a lively interest in all that is going on around him, and appears to be particularly interested in man. When walking or driving through districts in the United States where the squirrel abounds, scores of these little creatures will leap up on to fallen trunks of trees, rails, or other vantage points by the side of the track, and watch the coming passenger, and will not move until he is within a few paces of them, unless, indeed, he is armed with a gun, in which case they, as well as birds, soon come to understand that he is dangerous. The squirrel, like the rat, is excellent eating, although even where he abounds many persons have as great a prejudice against eating it as the ordinary English farmer would have against that real delicacy, a rat pie. Hunters, however, who shoot it for its skin highly appreciate its flesh, their only regret being that there is not more of it. The squirrel should never be kept in captivity; it is as gross an act of cruelty to confine it as it is to cage a skylark. If it is a punishment to man to be kept in a cell, how great must be the pain to a creature so restless, so full of life and activity, so happy and joyous in its freedom, as the squirrel. The result, as might be expected, is that, however well its wants may be attended to, in the great majority of cases it speedily pines and dies. If kept at all, it should be in a roomy aviary, enclosing shrubs and parts of trees of a sufficient size to enable it to indulge to some extent in its natural habits.

THE FLEA.

WHILE great pains are devoted to the breeding of horses, cattle, and sheep among animals, to that of several kinds of birds, and to the propagation of fish, the flea has been left to shift for itself, and has managed to thrive. Whether the flea was, in the first place, an inhabitant of all terrestrial portions of the globe, or whether, starting from a common centre, it speedily spread itself over the earth, is a point which has not been decided; but the habits of the flea admirably fit him as a traveller; he is a natural stowaway, and being able to subsist for a long time without nourishment, he can perform the longest journeys without inconvenience among the other belongings of the traveller to whom he has temporarily attached himself. At the same time, he manages if possible to become the personal attendant and companion of his fellow-voyager for the time being, and to carry, as it were, his food as well as his lodging with him. So constant are these migrations, so assiduous are fleas in their attachment to man, that it is computed that even if they started as distinct nationalities constant intermixture must have so leavened them that the whole race is now practically homogeneous, and speak a language common to all. Although partial to comfort,

and occasionally taking up his abode in the warm and cosy dwellings of the rich, the flea is by no means particular, and makes himself equally at home in the tent of the Arab, the hovel of the Mexican, the snowhouse of the Esquimaux, the cottage of the Spaniard, or the hut of the Persian. He will exist in the sand, and wait patiently for the chance passage of something he can devour ; but his preferences lie in the direction of crowded tenements, and the dirtier and more untidy the better. The flea rivals the dog in his affection for man ; he will cling to him to the last, and anger and even execrations do not shake his attachment. He is of a lively disposition, and there is nothing that he enjoys more than being hunted, entering thoroughly into the spirit of the thing, showing himself occasionally to inspire his eager pursuer with hope, and then disappearing into air. With other creatures it is generally safe to infer that they will leap forward. The flea, however, is bound by no rules, and can spring backward, forward, or sideways with equal ease. The power of his hind legs is prodigious, and it is well for man that he prefers to remain small, for a flea who took into his head to grow even as large as a cat would be a very formidable creature. It has been calculated by an American man of science that if the mule had the same proportionate power in his hind legs as has the flea, he could kick an ordinary-sized man 33 miles 1004 yards and 21 inches. Mankind has therefore good reason for congratulating itself upon the fact that the flea has not, in the course of his career, had any ambition in the direction of size, and that the smallest and most active only survived in the struggle for existence.

The habits of a flea have not been sufficiently investigated

to enable us to state with certainty whether he uses his hind legs as weapons in his contests with other insects ; but it is to be presumed that he does so, for why otherwise should Nature have endowed him with so much power in these limbs? If the ordinary mode of progression of the flea were, like that of the grasshopper, by a succession of springs, the prodigious size of his hind legs would be accountable ; but, upon the contrary, the flea is essentially a runner, and the speed with which he can make his way through the thick fur of a cat or the hair of a dog is wonderful. It does not appear, indeed, that he ever does take to jumping except when inclined to drive human beings on the search for him into a state of frenzy.

As it cannot be reasonably supposed that Nature gifted the flea with such abnormal saltatory powers merely that he should be a cause of bad language among the human kind, some other explanation must be sought for. The Darwinian theory, that living creatures develop by the survival of the fittest such powers as may be most useful to them, fails altogether here, unless it be supposed that the flea's legs have developed only since he made his acquaintance with man. In the earlier periods of his history, when he lived in the hair or fur of animals, he could have had no occasion whatever to jump. Unfortunately, the early historians, in dealing with the flea, are silent as to the length of his leaps, and we have, therefore, no means of estimating the rate at which he has progressed in this accomplishment during the last two or three thousand years. Yet, doubtless, he was present at the Siege of Troy, dwelt in the tent of Achilles, and stirred Ulysses to occasional wrath ; it would have been well, then, had Homer turned

for a moment from recording the struggles of the Greeks and Trojans, and given us a little solid information respecting the flea of those days.

Although abundant everywhere, he is found to be most prolific and numerous in the East. Upon this point all travellers are agreed. Some put it down to the fact that he loves heat ; others to his partiality for dirt ; while others again go back to the days of the Flood for the explanation. While other animals went into the Ark in pairs, it is morally certain that the flea went in his thousands ; and as the four men in charge of all the animals can have had but little time to attend to the flea, and as, so far as is known, insecticide powder was not invented in those days, the flea doubtless multiplied prodigiously during the long voyage. Not knowing what was going on outside, the colony would be taken by surprise when the animals suddenly quitted the Ark ; and vast numbers must have been left behind ; these must, after the departure of man and the animals from the mountain on which the Ark rested, have shifted for themselves as they best could. Some would have early started on their travels, others would have clung to the Ark until it fell to pieces ; but in time, at any rate, they must have scattered over the East, and there, being poor travellers except when carried, they and their descendants have remained ever since. It would be rash to say that this is the only plausible theory. Doubtless others can be advanced ; but, taking it altogether, it certainly appears the most probable explanation of the abundance of the flea in Asia, and it may be said in Russia also, and other contiguous countries.

The flea is capable of being tamed, and of affording

amusement to man by various little tricks. The first step in the process is to restrain his natural inclination to jump. This is done by placing him in a low, flat box with a glass lid. The flea, supposing that he has an open space overhead, jumps, strikes the glass with great violence, and falls half-stunned. This discourages him, but, unable to account for the phenomenon, he tries again and again, until at last, after some days, he arrives at the conclusion that there is something altogether wrong with the atmosphere, and that jumping must be abandoned. After this the rest is easy. He can be taught to drag a little carriage, to sit on the box, to fire a tiny cannon, or to perform other feats. He never, however, recovers thoroughly from the effect of his terrible blows against the glass. His heart and his spirit appear to be alike broken. Like a caged eagle he mopes out his life, and seldom lives more than a month or six weeks after his education is completed.

His is, in fact, the true gipsy spirit. Free, he will make himself happy under any circumstances, and although he may have his preferences, can get on anywhere. He loves the young and the tender, but does not despise age. Free, he is joyous, lively, and daring: a captive and chained, he pines and dies. It is a pity that no one will do for him what Sir John Lubbock has done for the ant. Such an investigator would no doubt be able to rehabilitate the flea in public estimation. Although he may be forced to live in dirty places, he is himself perfectly clean, taking great pains to clean himself with his hind legs, as does the fly. He is clad in shining armour, which is wonderfully tough and strong; his eyes are lively and prominent. Even in his most joyous moments he is never

noisy ; his attentions to man are unwearied, and the gentle irritation thereby caused affords means of occupation and excitement to the lazy mendicant, the indolent native of the South, and the contemplative Oriental, and rouses them from the lethargy in which they might otherwise sink. Fully and properly understood, the flea might take high rank among the benefactors of man.

THE MOSQUITO.

THERE is nothing in the appearance of the mosquito to excite alarm even in the most timid breasts, no sign of his almost diabolical nature, or of his power of making himself obnoxious. And yet he is endowed with a subtlety, a malice, and a fiendish thirst for blood unparalleled save in the leech. The mosquito is found in almost every climate and country, sounding his trumpet as vehemently by the shores of the Arctic Sea as beside a sluggish stream on the Equator, the British Islands being almost alone in their happy immunity from its presence ; and among all the varied blessings for which a Briton has cause to be thankful there is scarcely one so peculiar and so marked as the absence of this creature. It is probably seen at its worst in the north of Russia, Norway and Sweden, and in some of the Northern States of America. In these countries it is hardly safe to leave a horse out at night, for although we may safely discredit the legends that horses have been carried off bodily by mosquitoes, these animals have undoubtedly been killed by the poisonous bites of their innumerable foes. It is the methods of the mosquito rather than the injury it inflicts that drive men to madness. It is not that they are greatly grudged the drop or two of

blood they extract, and the pain and inflammation of the wound, though often considerable, are not very much more so than those of our own midnight assailants, the bug and the flea. If they would but come and have their meal in peace and quiet, man might bear it. It is their shrill trumpeting, their approaches and departures, and the long and agonising suspense that precedes the moment when, their investigation complete, they fix on what appears to them the most penetrable point, settle, and begin their meal, that crows the spirit of the bravest man. Heroes who would face the spring of an infuriated tiger, and lead a column to the cannon's mouth, will quail and cover their head with the sheet when they hear the shrill challenge of the mosquito.

Man has endeavoured by many means to defend himself from this persecutor. He has rubbed himself with medicaments, and has hung up boughs of shrubs to which it is supposed that the mosquito has an objection. He has invented pastilles, whose smoke, it was hoped, would lull his foe into a lethargy; but at all these and similar measures the mosquito laughs. The only resource affording even a partial protection is the mosquito curtain. In theory this device is excellent. Man enclosed within a curtain of gauze ought to be unassailable. Unfortunately the practice does not follow the theory. However secure the curtains, however great the pains bestowed in seeing that no mosquito was present when the man was tucked up inside them, we doubt whether history records a single example of complete success having attended the arrangement. Do what man will, the mosquito will be there. Its favourite plan is to be beforehand with a man, and to hide some-

where until man has entered his muslin tent. Every effort will, it knows, be made to dislodge it ; the curtains will be shaken, towels will be flapped here and there, every nook and corner will, as it seems, be examined, but the mosquito will manage in one way or other to evade the search. But even in the exceptional cases where it is routed out, the mosquito knows that it is but for a time. If there is a hole in the curtains, be it only the size of a knitting-needle, it will find it and get through ; and in the event of the curtains being absolutely new, it is sure to find some point at which the tucking up has been imperfectly done. But most of all it relies upon entering with the would-be sleeper. The latter is well aware of this. He listens first for the sound of wings, but at this moment the mosquito is discreetly silent. Then he untucks a small portion of the curtain, his attendant flaps a towel wildly, and under cover of this he plunges hastily through the orifice, which is at once closed behind him. Then, in spite of a thousand similar experiences, the man flatters himself that this time he has evaded the mosquito, and lies down to rest. Stronger and stronger grows the hope as the minutes pass on, and at last it almost blooms into certainty as he finally turns over and composes himself for sleep. Drowsiness steals over him, when, just as consciousness is leaving him, the mosquito sounds a triumphant bugle-blast close to his ear. Then the ordinary man sits up in bed as if he were shot, and swears. This is, unfortunately, all but universal. The best and most patient of men have found it absolutely impossible to avoid using bad language at this crisis. There is a shout for the attendant, a light is brought and placed on a table near the curtain. Then the battle begins in grim earnest, the

man against the mosquito ; the one silent and watchful, his arms outside the sheet ready for instant action, the other, agile, ubiquitous, intent on exasperating and not on attacking its victim, now resting for a time in a corner, then making a rapid dash at the nose or ear, then disappearing again, and lying silent for some minutes. Occasionally, very occasionally, the man is victor, and with a rapid clutch will grasp and annihilate the mosquito as it passes by his face. In the vast majority of cases the man's watchfulness is in vain. Hours pass, and Nature asserts herself. The mosquito has had amusement enough, and now, meaning business, remains quiet until its victim dozes off. Not until he is sound asleep will it this time move. Then it settles lightly upon him, inserts its delicate proboscis in one of the pores of his skin, pours in a tiny drop of venom to dilute the blood, and then having drunk till its body has swelled to many times its original size, heavily flies away, and fastens itself to the curtain, where it falls an easy victim to the vengeance of the sleeper in the morning. Such is the conflict when one mosquito has found an entrance. When, as is more usual, half a dozen have entered, it is, as may be imagined, still more dire and disastrous ; and the sleeper in the morning wakes with perhaps an eye closed, and his face swollen and disfigured by bumps almost beyond knowledge.

The existence of the mosquito can be accounted for only upon the ground that he was sent as a special trial to man's temper, but in that case Nature evidently miscalculated the amount of self-control that man possesses. A trial can hardly be considered as a trial when the result is certain, and the breakdown of man's temper under the attacks

of the mosquito is universal and complete. It would have been enough had the mosquito been endowed with activity, craft, and voracity. The trial would have been in that case ample, but exceptional men might have passed through it unscathed. It was the addition of the trumpet that settled the matter. No such exasperating sound is to be heard on earth. Good resolutions crumble to nought before it. The most patient and the most stoical of mortals are as much moved by it as their weaker brethren, and the native of the Arctic Circle and he of the Equator alike in their respective languages utter words of despair and profanity. We may hope, however, that science has not yet spoken its last word, and that some future Pasteur or Koch may discover a bacillus capable of creating a contagious and fatal disease among mosquitoes, and that by this means man may be relieved of a burden almost too heavy for him.

THE COW.

ALTHOUGH the cow is always with us, we know but little about her beyond her likes and dislikes in the matter of food. We have, indeed, by dint of long perseverance, transformed the wild cow into an eating machine—a vehicle for the conversion of feeding stuffs into milk and meat. Her brain is to us a sealed book, which so far no sage has made it his business to open. No one, however, can doubt that the cow does a great deal of thinking. In this respect it is among beasts as is the owl among birds. No one can watch a herd of cattle ruminating tranquilly, without being impressed with the conviction that they are thinking deeply. Whether they are meditating over the legends that have been handed down to them of the time when they wandered wild and free on mountain and moor, or are wondering why man busies himself in supplying them with the food most to their liking, while he requires no active service in return, as he does from the horse, we know not.

The eye of the ox is soft and meditative ; it has not inspired modern poets, but the ancients recognised its beauty, and the Greeks could find no more complimentary epithet for the Queen of the Gods than to call her ox-eyed.

Such an eye should certainly indicate a philosophic mind, and it is in this direction that we must regard it as probable that the cow's ruminations are directed. We may credit her with having arrived at a conclusion to her own satisfaction as to the points that have engaged the attention of a Darwin or a Spencer, but one can scarce conjecture that the cerebral organisation of the cow was beforehand with man in the discovery of the steam-engine or the electric telegraph. The Arabs and the Orientals, with their deep knowledge of the occult, were evidently impressed with the idea that the cow's brain is so stored with knowledge that it would be a danger to mankind were she able to put her thoughts into words. This is shown by the fact that, while in their legends the gift of speech is frequently bestowed on horses, storks, and birds of many kinds, there is no instance of a cow being so favoured. It may be said that the dog is similarly omitted; but the dog is an animal looked down upon in the East. It is there never admitted to the intimacy of man, and, having been habitually repressed, has not acquired the traits of character that distinguish it in Western countries. But in whatever light the matter is looked at, it cannot be doubted that it is unfortunate for the world that so profound a thinker as the cow is unable to communicate her conclusions to man.

The cow, as distinct from the bull, is in its wild state a timid animal, and it is somewhat singular that although she has lost much of that timidity, she largely inspires the feeling among the female sex. Next to the mouse, the ordinary woman fears the cow. The dog, a really more alarming animal, she is not afraid of; the horse inspires her with no terror; but the sight of two or three cows in a lane throws

her off her balance. On such an occasion a woman will perform feats of activity quite beyond her at ordinary times : she will



climb a five-barred gate, or squeeze herself through a gap in a hedge, regardless of rents or scratches, with as much

speed and alacrity as she would manifest in leaping on a chair in the presence of that ferocious animal the mouse. We believe that this unreasoning terror has its origin in the pernicious nursery legend of the cow with the crumpled horn. It is true that that animal is related to have suffered the maiden all forlorn to milk her, but she afterwards tossed the dog; and it is the pictorial representations of her while performing this feat that have impressed the juvenile mind. The mere fact that there are few precedents for a woman being tossed by a cow goes for nothing, nor that the animal's disposition is peaceable in the extreme; it can, therefore, be hardly questioned that the timidity excited in the female mind by the cow must be founded upon some lost legend of antiquity. It may be that Eve had trouble in her first efforts to procure lacteal fluid from the cow, or that the specimen chosen to perpetuate the race in the Ark was rendered savage and dangerous from its long imprisonment there; but no legend that would give favour to either theory has come down to us.

In her wild state the cow is compelled to take considerable exercise in order to obtain a sufficient amount of sustenance; the domesticated animal, having no need to do so, has developed habits of laziness. She has become constitutionally averse to exertion; but Providence, by sending the fly, has done much to counteract the effects of this tendency. It has been calculated by mechanical engineers that the amount of energy required to switch away flies with a cow's tail is equivalent to that which would raise a weight of seven pounds one foot. Intelligent observers estimate that upon a hot day when the flies are troublesome, a cow will switch her tail thirty times in the course of a minute, thus

expending an amount of energy per hour sufficient, if otherwise employed, to lift nearly six tons' weight one foot from the ground ; so that, considering the number of cows in Great Britain, it is clear that an amount of power in comparison to which that of Niagara is as nothing is being wasted. The thoughtful agriculturist will surely perceive that as an expenditure of energy means loss of flesh and decreased production of milk, it would be to his interest to envelop his cattle in mosquito curtains during the summer months.

The cow is best seen in a state of repose. Either as lying down or standing in the shade of a tree, dreamily chewing the cud, and vaguely wondering whether beet or turnips will form the staple of her supper, there are few animals more taking to the eye. She can walk, too, without forfeiting our respect, but she is a lamentable spectacle when she runs. The poetry of motion does not exist in the case of the cow, and yet it is clear that she takes the greatest pains about her running, and puts her whole heart into it ; personally, then, she is not to blame in that the result is, as an exhibition, a failure. The fault lies in nature rather than in the individual. In the course of the Darwinian process of transforming, let us say a mole into a cow, it was clearly in the creature's mind that the day would come when she would be milked. Each of the countless generations required to bring her to her present form kept this contingency steadily in view, and practised kicking sideways. The result is, so far as the milkmaid is concerned, a superb success, and the cow is able to kick sideways in a manner that excites the envious admiration of the horse ; but, as was to be expected, with the acquisition of the sideway motion the cow's leg lost the power possessed

so pre-eminently by the horse and mule of delivering a good, fair, square kick backwards; and even in running, what may be called the side action predominates over the fore and aft. Doubtless the cow knew her own business, and deliberately sacrificed gracefulness of action to the joy of being able to kick over a milkmaid. The lover of grace may regret that it should be so, but has no right to complain of the cow pleasing herself. The original mole probably foresaw that her far-off descendant would be a creature of few active enjoyments, and of a steady and tranquil nature, and considered that she was perfectly justified in making some sacrifice in order to enable the cow of the future to enjoy at least one piece of lively fun.

On the whole, however, the cow may fairly claim to be an eminently worthy and respectable animal, and to be of great importance to man. Some may feel inclined to say, of vital importance; but this may be disputed. It is due in a great degree to the attention that man has bestowed upon her that she has developed her capacity for putting on flesh, and her abnormal secretion of milk. Had man not found her ready to his hand, and foreseen her capacity in this direction, he might have turned his attention to the mastodon, which in that case would now be grazing in vast numbers among the woods planted for his sustenance, and would be affording mountains of flesh and tuns of milk, while mastodon butter might have been able to hold its own against margarine and other fatty compounds. The cow deserves great credit for developing herself into her wild type from some wandering germ or other, but for her progression to her present status she has to thank the care and attention she has received from man,

THE OCTOPUS AND CUTTLE FISH.

ALTHOUGH dignified by the name of a fish, the cuttle fish has nothing in common with the finny inhabitants of the sea, save that its existence is passed beneath the surface of the water. It stands alone, apart from all living creatures, with scarcely a point of resemblance to any of them, its nearest relations being, perhaps, the sea anemones—those lovely inhabitants of pools among rocks. Nature would seem to have created the octopus in an idle moment, in order to show how she could diverge from her regular course, and turn out a creature with a multiplicity of arms, without body or legs, and with its head in the middle of its stomach. As usual, she succeeded to perfection, but was so horrified with the monster she had made that she threw it into the sea, and endowed it with a diabolical disposition. The octopus resembles an ogre dwelling in its cave, conscious that its distorted shape will not bear the light, and stretching out its arms studded with suckers to grasp and draw down to its mouth any living thing that passes within its reach. The cuttle fish varies in size from the squid, beloved by gourmands who dwell on the shores of the Mediterranean, to the monster octopus who throws his arms round boats and drags them to the bottom. Some,

indeed, in the Indian seas, are reported to grow to a size that renders them formidable even to ships, wrapping them in its embrace and dragging the sailors from the deck or shrouds. Even allowing for exaggeration, there can be little doubt that enormous specimens are occasionally met with, and that these would be formidable to small vessels. Bodies have been cast ashore whose arms have measured thirty feet in length, and these could well pluck a sailor from the deck of a ship. On our own shores they are, happily, never met with of formidable size, but comparatively large ones are encountered not far south; for it may be taken that the desperate struggle described by Victor Hugo in "The Toilers of the Sea" was at least not considered by him to be impossible, and that he had heard from fishermen of the existence of creatures as large as the one he described. The octopus appears almost insensible to pain, and the hacking off of one or more of its tentacles does not seem to cause it any inconvenience. Its body—or rather its stomach—is its only vital part, and even this must be almost cut into pieces before it will relinquish the hold it has obtained of a prey. The beak of a parrot is the last thing one would expect to find in the centre of these waving tentacles, and Nature apparently placed it there as the crowning effort in the work of construction of this monster.

Among birds, beasts, and fishes we may seek in vain for a prototype of the octopus. To find one we must go to man, and we shall find that, in his way, the professional money-lender bears a close resemblance to this creature. The waving arms, that by their resemblance to great seaweeds lull a passing fish into a sense of security, are represented in the case of the money-lender by flattering and

unctuous advertisements, which, catching the eye of the unwary, persuade him that money is to be had for asking, upon terms to suit all pockets ; but, as in the case of the octopus, once the suckers catch hold, there is no escape ; nearer and nearer the victim is drawn, in spite of his struggles, to the parrot mouth that will tear him to pieces, and swallow up him and his belongings. The analogy is in all ways extremely close, and yet the man who would shudder at the thought of entering a cave in the depth of whose waters the octopus is lurking, will enter the professional money-lender's den with an unmoved countenance and an even pulse. Happily, there is every reason for supposing that the fish which form the staple of the diet of the octopus suffer less in the process of destruction than does the victim of the money-lender. Fish are certainly almost, if not entirely, insensible to pain, and there is no reason to suppose that they are gifted with strong powers of imagination ; it may therefore be believed that although a fish may struggle to escape from the grip of the tentacle, it feels none of the horror that seizes a human victim when once grasped by one of the larger species, and that its doom is hidden from it until the savage beak seizes it, and at once puts an end to its existence.

While man can to a certain extent enter into the feelings of a large proportion of the animal creation, it is beyond his power to imagine himself an octopus, or to get himself *en rapport* with its thoughts. Has it any higher impulses ? Is it naturally cruel, or does it view its own methods and conduct from a strictly business point ? Does it persuade itself that it is an estimable character ? Is it in its own private circle affectionate and domesticated ? Has it the

power of discussing passing events with its congeners, and exchanging views as to the flavour of the various fish that form its diet, or as to advantageous spots for ambush? We can answer none of these questions. It certainly has but a small chance of leading a higher life. The subterranean world it sees around it is full of strife and destruction. "The large fish eat the smaller fish, and so on *ad infinitum*." It only plays the same game as those around it, but by different methods, and there is no reason, because those methods are repugnant to us, that the octopus should be of the same opinion. Man is singularly intolerant in such matters. He himself kills the creatures he requires for food either by knocking them on the head, by cutting their throats, or by shooting them. Fish he captures either with nets or with a hook which sticks into their mouth or throat. And yet he criticises severely the methods of the animal creation. He dislikes the spider because like a fisherman it catches its prey in nets. He shudders at the cat because it plays with its victim just as the angler does. He is shocked because the octopus lies in wait for its prey and lassoes it as it passes. There is, in fact, no pleasing man, and he is shocked at all methods of killing, even at that most closely resembling those which he himself employs in slaying the creatures on which he feeds. We fear that there is a great deal of humbug about human susceptibilities.

Some of the cuttle fish are large manufacturers of ink. These, instead of anchoring themselves to the bottom, float near the surface, and their chance of obtaining food would be small were it not for their power of ejecting ink, and thus clouding the water and veiling themselves from

sight—a habit which also affords them a method of escape when themselves attacked by the shark or other formidable enemy. This method is not unknown to man, and several well-known instances might be adduced of public men who, after having by loose assertions brought a formidable opponent down upon them, escape under a cloud of misleading words, phrases, and explanations that explain nothing, and retractions that leave the matter as it was before. Seeing that the peculiar variety of ink secreted by the cuttle fish is of a very valuable kind, it is somewhat remarkable that no enterprising manufacturer has as yet taken the matter in hand and established an aqueous farm for the breeding and rearing of cuttle fish. Indian ink and sepia are both so valuable that such an enterprise ought to pay handsome profits, and if the oyster can be cultivated, why not the cuttle fish? It would, of course, be necessary that the retaining walls of the gigantic aquarium indicated should be impervious to the passing of cuttle fish even in their earliest stage. Otherwise the proprietors would be liable very speedily to be indicted as a nuisance by the lodging-house keepers and owners of bathing machines of the nearest sea-side watering places. But this could doubtless be effected, and then no argument could be adduced that the cuttle fish should necessarily be a nuisance to their neighbours that would not equally apply to the wild beasts at a menagerie. In the latter case one occasionally breaks out and causes consternation, and, possibly, damage, and even if an octopus should do the same there could be no very valid ground for complaint. As the squid when cooked furnishes a somewhat gelatinous food not altogether dissimilar to calf's head, it is probable that the flesh of the

larger varieties might be utilised for the manufacture of mock turtle, and another source of revenue would, therefore, be open to their breeders. It is clear from these remarks that the cuttle fish has not hitherto received the careful consideration that it deserves, and the dislike we feel for its form and habits has blinded us to the benefits that might with culture and domestication be derived from it.

THE BACILLUS.

HAD the learned Linnæus been informed that there existed a creature of which he had taken no account, which exercised a much larger influence upon the fortunes and happiness of man than any of those which he so laboriously arranged and classified, he would have smiled the smile of incredulity. But just as it is but within the present century that mankind has awoke to the enormous power and usefulness of steam and electricity, so it is only within the last ten or fifteen years that he has attained to the knowledge of the existence of the demon bacillus, who has sprung at a bound into the position of man's deadliest enemy. Secretiveness must be assigned the first place among the characteristics of the bacillus. Since man first appeared upon earth this scourge must have carried on its deadly work, and heaped up a hecatomb of victims in comparison to which those who have perished by war or by famine are but an insignificant handful; and yet man has pursued his way in the blindest ignorance of the very existence of his indefatigable enemy.

Even yet comparatively few people are aware of the personal peculiarities of the bacillus, or could describe with any approach to accuracy the difference between the allied

tribes, each of which represents some form or other of disease or death, and the scientific men who are so actively busying themselves in counteracting its work are very chary of describing its personal peculiarities. When these are more generally understood it will probably lead to a revolution in art. The artist of other days who wished to convey to the beholder that the personage depicted was in imminent peril of his life could find no better means of doing so than by placing behind him a shadowy figure with a death's head and skeleton arms holding a dart. This childish representation can no longer be tolerated, and the artist of the future will have only to depict hovering over the principal figure a bacillus, and the beholder will at once understand not only that death is impending, but will be able to distinguish from the characteristics of the bacillus whether it will take the form of consumption, typhoid, small-pox, or other disease. This will be of vast utility in the painting of historical personages, as no questions can arise centuries later as to the cause of their death, the disease of which they died being clearly indicated by the accompanying bacillus, which, of course, will in future be appended to every posthumous portrait.

It is mortifying to human vanity to reflect that for some sixty centuries, at the shortest computation, man has been taking all sorts of pains to protect himself against minor dangers, in absolute ignorance of the bacillus fiend in his midst. Against the wild beast and the snake he has waged open warfare. He has covered himself with armour to protect himself from the weapons of human foes. He has furnished his ships with lifeboats, he has placed trap-doors in the roofs of his houses to afford an escape in case of

fire, and has invented the safety lamp as a protection for those who work in mines. He has muzzled the dog in order to escape the fabulously remote risk of hydrophobia, and he has laid down strict regulations to diminish the chances of his being blown up by explosives. He has fenced himself in by sanitary regulations to preserve himself against the CHOLERA BACILLUS (Natural Size). evil effect of foul smells, and has

flattered himself that by these and many other precautions he has done what he could to ensure for himself prolonged life. And yet all this time the bacillus has been carrying on his work unsuspected, laughing, in whatever passes as his sleeve, as he yearly sweeps away his

SMALL-POX BACILLUS (Natural Size). tens of millions of victims. It has,

in fact, been a new and terrible illustration of the saying, "Out of sight, out of mind."

Proud man, who slays the whale for its oil, and the elephant for its ivory, has been slain by his invisible foe, the bacillus; and, like a soldier brought down by a long range bullet, has not even had the satis-

faction of knowing who was his TYPHOID BACILLUS (Natural Size). slayer.

The microscope has long since discovered to him the existence of innumerable creatures, invisible to the naked eye; he has learnt that the water he drank teemed with ani-

mated atoms ; that many of the rocks were composed solely of their minute skeletons ; that a layer of them reposed on the depth of ocean ; that countless numbers of them were borne with the floating dust in the air. Some of these discoveries caused him wonder and admiration, others a certain sense of uneasiness and disgust ; but when he discovered that neither he nor his ancestors had suffered any material inconvenience from imbibing these countless hosts in their drinks, or inhaling them in the atmosphere, he ceased to trouble himself about them, and went on his way regardless of their existence. The case has been wholly changed by the discovery of the bacillus, and man stands aghast alike at the terribly destructive and deadly nature of his foe, and at his own impotency to guard himself against its attacks. His feelings resemble those of the solitary traveller who finds that the forest through which he is passing is swarming with desperate and determined enemies, who are bent upon taking his life.

It needs no great powers of prevision to perceive that the discovery of the bacillus must lead to an enormous revolution in our methods of life. It is not man's nature to submit passively to tyranny and oppression ; and now that we are beginning to form some idea of the number and deadly nature of our foe, we shall assuredly embark upon a prolonged and desperate warfare with him. Inventors will, in the first place, devote all their energies to discovering a means of defence against his attacks. We may expect that just as our ancestors clad themselves in armour to protect themselves against human weapons, so in the future we shall wear some sort of covering, composed, perhaps, of extremely thin and flexible glass, to

prevent the bacillus coming in contact with our skin ; or we may paint ourselves on emerging from our baths with some compound which may be discovered to be lethal to him. The passages to our lungs will doubtless be defended by a respiratory apparatus that will filter him out of the air as it passes in. While thus we endeavour in every way to defend ourselves against his attacks, we shall take the offensive against him when he succeeds in eluding these precautions, and effecting an entrance. Unfortunately, at present the bacillus shows himself to be almost invulnerable ; but, like Achilles, he has a weak spot in his heel. While able, so far as is at present known, to defy all drugs and poisons with which he can be attacked while dwelling in the human frame, he has none of the hardihood of the cannibal, and is unable to support a diet consisting of infusions of his own relations. A boiled decoction of his children or cousins is fatal to him. It is upon this line that our combat with him is likely, at any rate for a time, to be fought out.

This discovery has thrown a lurid light upon many ancient and Eastern legends. These have hitherto been entirely misunderstood or not understood at all. Saturn was, we know, to be destroyed by his children ; and Arab stories abound with instances where princes and rulers having been warned that their offspring would be the cause of their death, the children were accordingly confined in towers and prisons to prevent the fulfilment of these prophecies. Hitherto, such tales have appeared mere fables, originating in human fancy ; but it can now be seen that the Ancients and the Orientals alike had some kind of prevision of the bacillus, and that this creature was pre-figured in the legends

of Saturn and of the Arabian rulers. This is another proof, were it needed, of the vast store of knowledge possessed in former times by the Orientals. It is impossible, at this early stage of the conflict between man and the bacillus, to form any very definite opinion as to the side with which victory will finally rest ; but, judging from the past, there is good ground for belief that man will in the end come out conqueror. In legendary tales man, valiant, fearless, and determined, always proved himself the victor, though opposed by the invisible powers of the air ; and from this we may gather much comfort. It is with invisible powers that this battle has to be waged ; and summoning to our aid, as we are happily able to do, all the hidden powers of the good fairies, Chemistry and Electricity, we may venture confidently to hope for a final victory over the swarming legions of the bacillus.

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